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AT&T targets Europe with Istel buyout

By Bob Brown
Senior Editor

LONDON — In a major thrust into the international information services market, AT&T last week said it plans to acquire value-added network operator Istel, Ltd., based here, for about $280 million.

The move positions AT&T as an important player in the expanding European information services arena and reflects the carrier's increasing aggressiveness in pursuing international opportunities, analysts said. It will also make it easier for AT&T's U.S. customers to expand or implement international nets.

The privately held Istel is a leading provider of value-added network and systems integration services in the U.K. With AT&T's backing, analysts said Istel will be able to expand throughout Europe, taking advantage of falling trade barriers. Istel garners about 95% of its $145 million in revenue from the U.K.

Istel services range from videotex to electronic data interchange and are offered to users in a variety of industries, including financial services, health care, manufacturing, travel, retail, distribution and automotive.

Istel's board of directors has approved AT&T's offer, which must now be approved by Istel's

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PHOTO ©1989 BART BARTHOLOMEW

Bill Selmeier explains Fujitsu's ISDN demonstration at the annual TCA exhibition and conference last week. See stories on pages 4 to 8.

NetView graphic interface demo gets mixed response

IBM stages TCA exhibition of new NetCenter; show goers divided over usefulness of product.

By Paul Desmond
Senior Writer

SAN DIEGO — IBM gave the first public demonstration of its newly acquired graphical interface for NetView at the Tele-Communications Association, Inc. (TCA) conference here last week, getting mixed reviews from users who saw it in action.

Some users said the interface appeared to provide the simplified NetView control tool they've been clamoring for, although they tempered their enthusiasm by noting that IBM has yet to release pricing and detailed product literature. But others said the interface would be ineffective for overseeing large networks.

Traffic was brisk in the IBM booth at TCA's annual show, and many of the attendees who stopped by for the demonstration of IBM's NetCenter graphical interface were themselves vendors. IBM acquired NetCenter in August from US West Network Systems, Inc.

In addition to NetCenter, IBM also demonstrated some of the NetView/PC applications developed by its business partners. At the same time it announced NetCenter, IBM also said it would sell some third-party NetView/PC applications ("IBM refines NetView, closes Siemens deal," *NW*, Aug. 21).

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NetFrame ushers in the superserver era

'First network mainframes' run standard net software but overcome limitations of PC servers.

By Susan Breidenbach
West Coast Bureau Chief

SANTA CLARA, Calif. — Start-up company NetFrame Systems, Inc. last week ushered in the era of the superserver with the introduction of a line of local network servers it bills as "the world's first network mainframes."

The NetFrame servers, available in three models, run standard network software, such as Novell, Inc.'s NetWare 386 and Microsoft Corp.'s OS/2 LAN Manager, but are designed to overcome the limitations of personal computers retrofitted for use as servers.

The NetFrame servers are based on multiple processors and have a mainframe-type I/O architecture that eliminates the I/O bottleneck associated with traditional network file servers.

The NetFrame rollout precedes the expected introduction today of a similar product by start-up Auspex Systems, Inc. (see "Auspex superserver ups I/O processing," page 21). The NetFrame and Auspex systems, while aimed at different market segments, represent an emerging class of computers designed as high-performance net servers.

"The NetFrame servers are optimized for processing network requests from personal computers on LANs," said Carlton Amdahl, NetFrame founder, chairman and chief technical officer. Amdahl, who designed the products, is the son of pioneering

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INSIDE

Data switch Buyer's Guide, page 43.

LAN Manager OEMs await market rally

By Susan Breidenbach
and Gail Runnoe
Network World Staff

Rank-and-file members of Microsoft Corp.'s LAN Manager OEM team have retired to the bench for the time being to watch industry leaders IBM and 3Com Corp. struggle to produce sales.

Second-tier OEMs that already have a LAN Manager product are making few visible efforts to market it, at least on the domestic scene, and companies that have yet to release products say they're in no hurry to do so.

Stuck with guaranteed royalty payments to Microsoft and burdened with development costs and, in some cases, inventory, these OEMs are rooting from the sidelines, stoutly professing their commitment to LAN Manager.

But a number of the vendors are growing openly critical of what they regard as the failure of the key players to ignite the LAN Manager market.

"You need a champion to go out there and demonstrate LAN Manager's performance and

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NETLINE

INSURANCE FIRM saves big with T-1 net and AT&T collocation. Page 2.

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AT&T'S ENHANCED Fax paves way for multipoint distribution. Page 4.

BRITISH COMPANY first to sign up for US Sprint's international virtual net. Page 5.

NCR COMTEN preps pack for bringing NCR front ends under NetView control. Page 6.

NEWSPAPER

FEATURE

Vendors who con users and users who trust them

By Bruce Guptill
Features Writer

Walk the floor at any trade show or association meeting and you'll observe two closely related activities: vendors hawking their wares to potential customers and attendees sharing horror stories about vendors' sales tactics. On a good day, you'll hear about enough vendor lying, cheating and stealing to fill a season of prime-time soap operas.

Of course, all of the stories can't be true. Most of what we overhear is hearsay; it happened to "a friend of a guy I used to know." But a germ of truth is found in many stories, and enough users express outrage — and fear — at vendors' sales tactics that the subject is worth examining.

No vendor will go on record saying "We bribe people" or "We threaten buyers" or even "We'll do anything to sell our stuff."

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Cigna to save $2m a year with AT&T's net services

Cigna cleans out a web of circuits, opting for combo of BMS and other centralized services.

By Jim Brown
Senior Editor

WINDSOR, Conn. — Cigna Corp. last week said it is using a mix of AT&T's Accunet T1.5 services, including its Bandwidth Management Service (BMS) option, to lop $2 million a year off its data networking costs.

The services helped the insurance conglomerate build what is in essence a private T-1 net based on carrier-provided services and central office-based equipment.

Cigna routes AT&T Dataphone Digital Service circuits serving remote offices to AT&T switching centers, where data is multiplexed onto Accunet T1.5 circuits. Those T-1 circuits are then routed to one of three Cigna data centers.

This eliminates the web of point-to-point Dataphone Digital Service circuits that were used to connect Cigna's more than 1,500 remote sites to the data centers. Cigna uses BMS to control and reconfigure the T-1 circuits and AT&T central office-based Tellabs, Inc. 745 T-1 multiplexers.

"It's like having a private network, only the nodes are shared between AT&T central offices and the customer premises," said Rich Batchelder, Cigna's director of network planning.

Cigna uses T-1 multiplexers in AT&T central offices in Hartford, Conn., Philadelphia, Chicago, Atlanta, Dallas and Denver. Cigna has its own Tellabs 745 T-1 multiplexers in its data centers here and in Philadelphia and Denver. It will use T-1 multiplexers in

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Sun unveils products to beef up new net strategy

SunNet bolsters work group computing position.

By Laura DiDio
Senior Editor

FRAMINGHAM, Mass. — Sun Microsystems, Inc. last week announced a networking strategy and the first products under that umbrella, including Fiber Distributed Data Interface (FDDI) and network management offerings.

The strategy, called SunNet, bolsters the company's existing work group computing strategy by promising adherence to more networking standards, a net management approach that builds on standards and greater workstation connectivity options.

Products announced as part of SunNet include a workstation interface for 100M bit/sec FDDI local networks, network management software, a gateway that enables Sun workstations to be channel-attached to IBM mainframes and a high-speed serial interface that can be used to link Sun workstations using T-1 lines.

Michael Howard, vice-president of Infonetics, Inc., a consulting firm in Santa Clara, Calif., hailed both SunNet and the new

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Unisys to market AT&T's Accumaster Integrator

By Bob Brown
Senior Editor

BLUE BELL, Pa. — As expected, Unisys Corp. said last week that it has signed a comarketing agreement with AT&T under which it will sell the carrier's Accumaster Integrator network management system in the U.S.

Unisys plans to position Accumaster Integrator as the top level within its umbrella Unisys Network Management System. With Accumaster Integrator, users for the first time will be able to manage from a single workstation all of Unisys' network management products, including its Timeplex, Inc.'s soon-to-be-released Time/View Network Management System for managing assorted Timeplex products. Accumaster Integrator will also let users control other vendors' products from a single site.

Accumaster Integrator is a vital cog in AT&T's Unified Network Management Architecture. It provides network managers with centralized control of multivendor network management systems that oversee net equipment and services.

Accumaster Integrator will be available in the fourth quarter of this year.

The agreement is important because it helps clarify how Unisys will integrate its disparate product lines, said Paris Burstyn, director of telecommunications

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Briefs

ISDN group shifts course? The Executive Steering Committee of the North American ISDN Users' (NIU) Forum last Friday formed a subcommittee to consider proposals regarding future administration of the forum.

One proposal, outlined in an internal document, is to turn over control of the group from the National Institute of Standards and Technology to a nonprofit corporation that would oversee the forum and "a potential range of activities relating to the ISDN marketplace."

More details will be announced at the forum's meeting Oct. 9 to 12 in Phoenix.

Telecom's most wanted. New York Telephone Co. last week quadrupled to $100,000 its reward for information leading to the arrest and conviction of anyone who intentionally damages the company's network. That followed an incident earlier in the week when saboteurs severed underground cables supporting 12,000 voice and data circuits in Freeport, N.Y., just outside New York city.

New York Telephone said the incident was the worst act of sabotage since a strike against the company began on Aug. 6. More than 325 acts of sabotage have interrupted telephone service to nearly 100,000 customers since then, the carrier said.

Developers endorse LAN Manager/X. Four of the industry's top data base software vendors last week said they will develop applications for Hewlett-Packard Co.'s Unix-based LAN Manager/X, which is due out this December.

Informix Software, Inc., Oracle Corp., Relational Technology, Inc. and Sybase, Inc., which together account for 85% of the relational data base software market for Unix systems, said they will build distributed applications based on HP's LAN Manager/X.

The companies did not give specific release dates for the applications, but they are expected to become available within a year, an HP spokeswoman said.

MCI plans service cutover. MCI Communications Corp. this week will begin offering its Switched 56 and Digital Reconfiguration Service (DRS). Both services were introduced earlier this year (see "MCI unveils commercial billing plan," page 7).

Switched 56 initially will be available in 180 cities to users of MCI's Prism I and Vnet; DRS will be available in 200 cities this week.

DEC, StrataCom team up. Digital Equipment Corp. last week expanded its relationship with StrataCom, Inc. by announcing an effort to develop a T-1 packet mode interface between StrataCom's IPX FastPacket T-1 multiplexers and DECnet routers. The partners said the high-speed link will allow Ethernets to send data through StrataCom multiplexers in packet form. That promises to increase speed, improve line utilization and cut the number of circuits required to link multiple sites, they said. DEC said the interface will be delivered within 18 months and expects to share the specifications with others.

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Network World
Box 9171, 375 Cochituate Road
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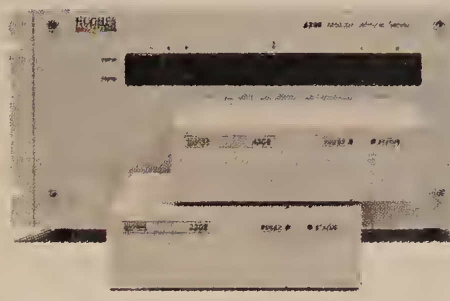

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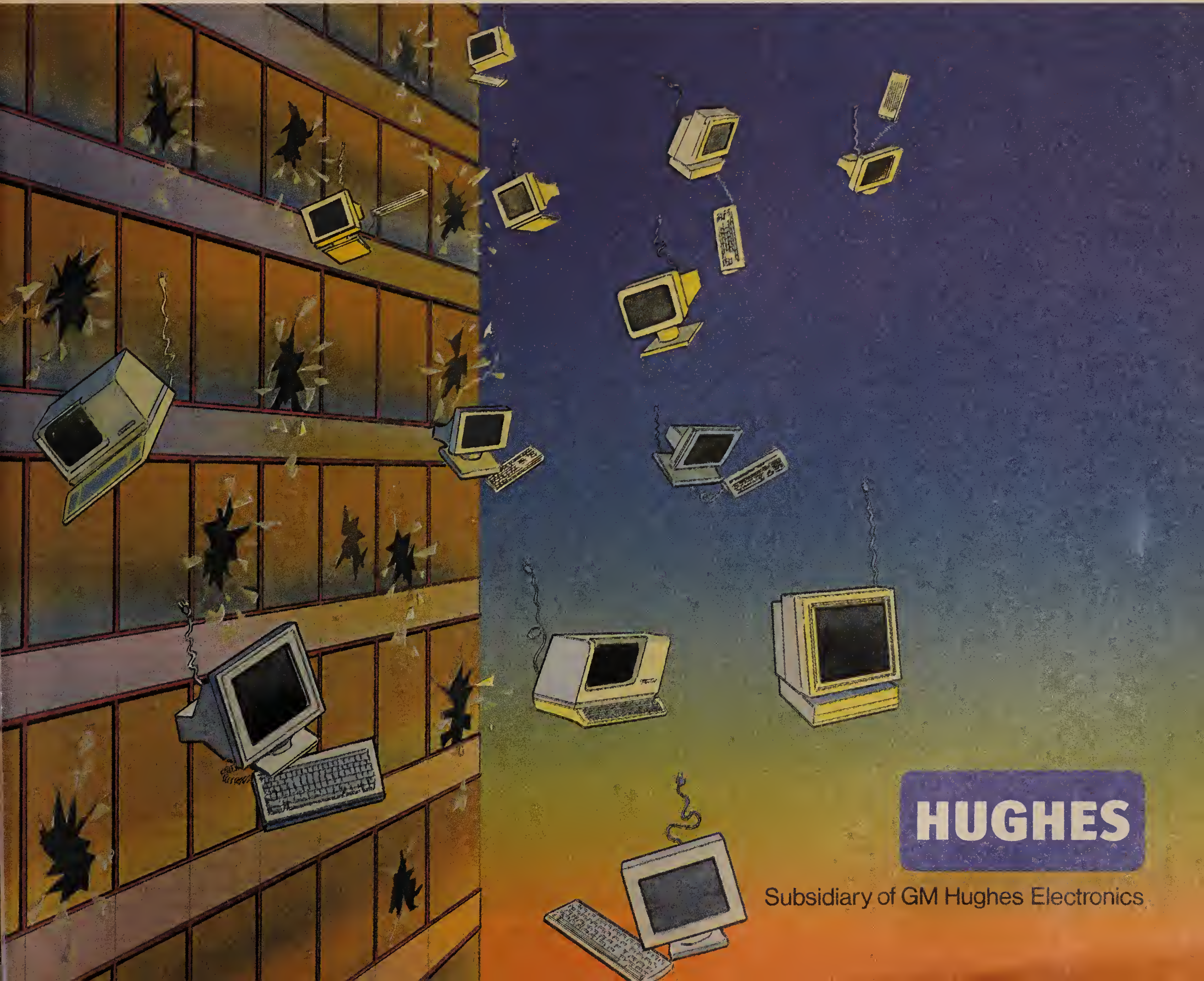

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Videoconferencing use to snowball, say TCA goers

Price/performance improvements spur usage.

By Barton Crockett
Senior Editor

SAN DIEGO — After years as a bit player in user networks, videoconferencing seems poised to take on a bigger role.

Users interviewed by *Network World* at the Tele-Communications Association, Inc.'s Annual Conference and Exposition here last week said that falling transmission prices, declining cost and increasing functionality of low-speed videoconferencing systems have made them consider implementing the technology in their organizations.

Users say videoconferencing promises to cut travel costs, improve corporate communications and speed decision-making.

"We've been tracking videoconferencing for years," said Donald O'Connor, director of data center operations at the Irvine, Calif.-based engineering company Fluor Daniel, Inc. "With the cost of bandwidth and [videoconferencing] gear declining, I believe it's finally gotten to the point where it makes sense for users to do this."

O'Connor said his company plans to begin tests in January of a 768K bit/sec videoconferencing link between Fluor Daniel headquarters and a major office in Greenville, S.C. He said the trial should last about four months, after which the videoconferencing link will probably become permanent.

The link will be supported by a full T-1 circuit, with the remainder of the T-1 capacity used for other applications.

O'Connor added that, in subsequent years, he hopes to expand the use of videoconferencing throughout the corporation. He said low-speed videoconferencing is becoming more appealing to users because technological advancements have decreased the cost and improved the functionality of these systems.

The availability of switched 56K bit/sec services and the declining cost of dedicated circuits is making the transmission portion of the videoconferencing outlay less daunting, O'Connor said. In addition, the cost of videoconferencing coder/decoders, which compress and transmit video signals, has declined markedly over the past few years.

> "We think videoconferencing will help us make decisions and reduce costs."
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All this has happened while the quality of audio and image transmission associated with low-speed videoconferencing systems has improved.

"We think videoconferencing is something that will help us make better decisions and reduce costs," O'Connor said. "By doing that, videoconferencing could make our company more competitive."

Users said they were planning to implement videoconferencing to decrease travel, improve meetings and cut the time it takes their organizations to make decisions.

Roger Stefan, network manager with the state of Washington's Employment Security Division, said his organization is considering installing a videoconferencing system that would link offices in Olympia, Spokane and Seattle. Much of the justification for the implementation, Stefan said, is reducing travel.

He explained that state employees frequently drive between state offices in the three cities, forcing them to brave the often snow-laden passes of the Cascade Mountain range.

"We get some terrible storms up there in winter that make those passes quite dangerous," Stefan said.

By implementing videoconferencing, Stefan said the state could markedly reduce the number of arduous trips state employees must make.

"One division could mobilize the entire state to implement videoconferencing," Stefan said.

Joseph Donovan, telecommunications consultant for Northbrook, Ill.-based A.C. Nielsen Co., a subsidiary of The Dun & Bradstreet Corp., said his company is considering implementing videoconferencing links between its Northbrook headquarters and its Green Bay, Wis., offices.

"Videoconferencing makes it easier to call people together for meetings and get the people involved who really need to be there, since you don't have to travel," Donovan said.

"The end result is that you can speed up the decision-making process," he added.

Donovan said A.C. Nielsen is currently pilot-testing various low-speed videoconferencing links between the Northbrook and Green Bay offices and could make a final decision on whether to implement the technology in a few weeks. ◪

PHOTO ©1989 BART BARTHOLOMEW

AT&T's Karen Arnett announces the new Enhanced Fax service.

AT&T offers advanced fax capabilities

By Gail Runnoe
Washington Correspondent

SAN DIEGO — AT&T last week announced at the Tele-Communications Association, Inc. conference here a facsimile service that provides users with such advanced capabilities as document store-and-forward and multipoint fax distribution.

AT&T Enhanced Fax allows users to establish fax mailboxes to which documents may be delivered. The user can access the mailbox from any telephone using a special identification code. A customer can also store documents in the mailbox for transmission to another fax machine through Enhanced Fax's autoforward feature.

The service's broadcast capability allows users to send documents to thousands of locations almost simultaneously by sending a single copy to AT&T, the carrier said. AT&T Enhanced Fax also provides voice prompting to instruct users on how to access those capabilities.

Karl Sterne, senior analyst at Market Intelligence Research Co. in Mountain View, Calif., said the broadcast feature is the most important aspect of the AT&T Enhanced Fax offering.

"While [broadcasting] can be done by a lot of the expensive fax machines, it still ties up the user's line," he said. By using a network-based broadcast service, the user's machine is free to receive or send other messages.

The AT&T announcement appears to be a direct response to MCI Communications Corp.'s MCI Fax service, which MCI claims has been well received by users. MCI Fax, which the carrier says is based on a dedicated portion of its long-distance network, supports a variety of capabilities including fax broadcast.

However, Sterne said he did not believe the MCI service, announced late last year, had been hurting AT&T's sales.

With AT&T Enhanced Fax, users can create and modify distribution lists through a voice-prompted instruction menu and a push-button phone, or through a personal computer or terminal and AT&T Mail.

AT&T said AT&T Enhanced Fax will be available in mid-December and will be priced on a per-page basis. In the U.S., the cost is 60 cents per page, while international fax messages range from $1.42 to $5.99 per page. Costs for the service also include a $10 monthly fee, which AT&T will waive during the first three months of usage as part of an early sign-up promotion.

Teleflora will begin beta-testing the new service this week, said Gene Berning, director of Teleflora technologies. His company was eager to sign up for the service because of its voice prompting features and the potential cost savings.

Berning said the voice prompts will enable anyone in the company to use the fax service, regardless of their expertise. Teleflora expects to save 25% to 35% annually on fax transmission, compared with the cost of sending faxes over AT&T's direct-dial long-distance service.

AT&T also said it plans to offer voice-messaging service as part of its Global Messaging portfolio, which now includes Enhanced Fax and the existing AT&T EDI and AT&T Mail services. ◪

Consumers Software adds X.400 messaging gateway

By Tom Smith
New Products Editor

CHICAGO — Consumers Software, Inc. this week is expected to announce an X.400 gateway that enables users of its local network-based Inter-network Courier electronic mail software to exchange messages with other X.400-compliant E-mail systems.

The company plans to roll out The Network Courier 400 gateway at the Electronic Mail Association meeting here. The announcement illustrates growing support for the X.400 messaging standard among vendors of proprietary E-mail products.

The Inter-network Courier is a local net-to-local net E-mail package that runs on Novell, Inc., 3Com Corp., Banyan Systems, Inc. or any DOS-based local net.

The Network Courier 400 runs in a server equipped with an X.25 adapter, enabling the system to transmit X.400 messages across a packet-switched network. That card is bundled with the product and is offered through an OEM agreement with Eicon Technology Corp. of Montreal. The server supports what the company calls a post office for E-mail messages.

The gateway periodically scans the post office for messages to be delivered beyond the local network. It translates those messages from The Inter-network Courier's proprietary format into CCITT-compliant X.400 format.

Eicon's X.25 adapter handles packet assembly for transmission of the message over the data network. At the receiving end, another X.25 adapter disassembles the packets and an X.400 gateway translates the X.400 message into the format of the receiving E-mail package.

The X.400 gateway complements Consumers Software's existing product line. That line includes the Network Courier for intranetwork messaging, as well as a gateway to IBM's Professional Office System and a soon-to-be-announced gateway to IBM's Systems Network Architecture Distribution Services, said Jack Grushcow, president of Consumers Software.

Consumers Software can now fulfill both intracorporate and intercorporate messaging needs. "We're proving we can operate as a peer in the [Open Systems Interconnection] world," he said.

The X.400 gateway will support addressing features that enable users to employ simple addresses that are automatically translated into more complex X.400 addresses. Users can cre-

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Correction: The article titled "IBM vows to lead OS/2 LAN charge" (*NW*, Aug. 28) incorrectly stated that DOS workstations have to communicate with IBM's LAN Server through a PC LAN Program server.

DOS workstations running PC LAN Program 1.31 in redirector, receiver or messenger modes can communicate directly with LAN Server, IBM said.

PC LAN Program is sold for $250 for a single copy. It can be configured as either a dedicated or nondedicated server. In any configuration, it can redirect DOS net requests via Network Basic I/O System to a server running OS/2 LAN Server.

U.K. firm signs int'l VPN agreement with US Sprint

By Bob Wallace
Senior Editor

SAN DIEGO — Grand Metropolitan PLC, a London-based conglomerate with U.S. holdings, last week became one of US Sprint Communications Co.'s first International Virtual Private Network (IVPN) users.

The $23.4 million contract with Grand Metropolitan was one of several announcements US Sprint made at the Tele-Communications Association, Inc. (TCA) conference here, including reduced rates for international digital services and a connection deal with a Japanese carrier.

In the Grand Metropolitan deal, US Sprint will provide a virtual network to link the company's U.K. headquarters with its U.S. subsidiaries, which include Burger King Corp., Pillsbury Co., Heublein, Inc., Alpo Petfoods, Inc. and Pearle Vision Centers.

The international links will be carried over the Private TransAtlantic Telecommunications System, Inc., a fiber-optic cable US Sprint owns with Cable & Wireless PLC. Grand Metropolitan will be a beta-test user of IVPN, which US Sprint hopes to offer commercially beginning in the second quarter of 1990.

US Sprint's Larry Lake at the TCA announcement

The domestic part of the network will serve 900 Burger King locations, 226 Pillsbury sites, 66 Heublein locations, 16 Alpo offices and 14 Pearle sites, according to the carrier.

US Sprint will become Grand Metropolitan's primary carrier in the U.S. as well as between the U.S. and the U.K., replacing rivals AT&T and MCI Communications Corp.

Grand Metropolitan's U.S. subsidiaries will also use several other US Sprint services, including Ultra 800 and international switched services. US Sprint's data communications subsidiary, Telenet Communications Corp., already provides the company with $1.5 million worth of data services.

In one of many separate announcements, US Sprint formally introduced a series of digital services ("US Sprint launches new service blitz," *NW,* Sept. 25). The services include fractional T-1, a family of digital data services and a digital alternative to analog trunks used for applications such as tie lines.

The carrier also used the show to announce reduced rates for international digital services to the U.K. and said it would extend an existing promotional discount program for its domestic Clearline 1.5 T-1 service.

The rate reductions for international services apply to switched 56K bit/sec and T-1 services. The reductions range up to 18% for users that sign one-year contracts and up to 11% for customers that sign three- to five-year contracts.

US Sprint announced reduced rates for international digital services to the U.K.

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The promotion for domestic Clearline 1.5 service has been extended for customers that order service before Oct. 31 and receive installation before March 31.

Under terms of the promotion, US Sprint waives onetime installation fees and provides the first 30 days of service free of charge.

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See the Faxnet Form on Page #47

Conference goers remain hopeful despite problems with ISDN demos

By Wayne Eckerson
Staff Writer

SAN DIEGO — Problems that marred many of the live ISDN demonstrations at the Tele-Communications Association, Inc. (TCA) conference here last week failed to dampen the enthusiasm of users, who said the technology will fit into their networking plans in the 1990s.

About a half-dozen vendors at TCA's 27th annual conference demonstrated a host of applications supported by Integrated Services Digital Network Basic Rate Interface lines. These included local network-to-local network connectivity, simultaneous voice/data transmission, Group IV facsimile, personal computer communications, ISDN via satellite and videoconferencing.

But technical and other snags tripped up several demonstrations. Equipment failed to operate as expected or wasn't delivered as planned, and some vendor representatives had trouble operating the demonstrated applications.

PHOTO ©1989 BART BARTHOLOMEW

Farewell. After years at the Town & Country Convention Center, the TCA show moves to the new San Diego Convention Center next year.

Users seemed to take that in stride and focused instead on how ISDN will fit into their operations. "Most users know ISDN is on the horizon and are trying to define applications they can use," said William Trout, senior telecommunications specialist at the Great-West Life Assurance Co. in Englewood, Colo. Trout said his company is interested in ISDN-supported automatic number identification (ANI), which promises to improve customer service.

"I was relieved to find that most users at the conference seem to be in the same boat I'm in: They're looking at ISDN, but not ready to implement it," Trout said.

Pacific Bell provided 21 ISDN Basic Rate Interface circuits from an ISDN-compatible switch three miles from the show. Basic Rate Interface lines support two B channels carrying voice or data at 64K bit/sec each and one D channel carrying 16K bit/sec of signaling information or packet-switched data.

Fujitsu Network Switching of America, Inc. used seven ISDN lines to demonstrate a variety of applications, including local network-to-local network bridging, simultaneous voice/data transmission and Group IV facsimile.

The company established a Basic Rate Interface link between a token-ring network and an Ethernet local net supporting personal computers, file servers and printers. Each local network was equipped with a Vitalink Communications Corp. TransPATH router and a Fujitsu SRS410 ISDN terminal adapter.

Because of software problems, however, Fujitsu could not transfer files between the local networks.

Despite the foul-up, there was a lot of interest in using ISDN as a wide-area link between local networks.

Mary Johnston, a principal at Boston-based Northeast Consulting Resources, Inc., said users will embrace such ISDN bridging in the mid- to late-1990s.

Because ISDN provides 64K bit/sec digital connectivity on demand, it will allow corporations to connect local network users in different divisions who need to exchange data or transfer files when collaborating on research projects, Johnston said.

ISDN takes to the air

Communications Satellite Corp. established ISDN connections across several continents via satellites. COMSAT supported Basic Rate Interface circuits over 2.048M bit/sec European T-1 links among San Diego, Singapore and Sydney, Australia, using two International Telecommunications Satellite Organization satellites.

The ISDN links supported communications among Group IV fax machines, digital telephones, video telephones, personal computers and slow-scan video systems. International carriers Australia-Overseas Telecommunications Commission (OTC) and Singapore-The Telecommunication Authority supervised the demos in their countries.

However, not all the applications worked as planned. For example, digital telephones supporting two B channels were lost during shipment and the replacement phones, which supported only one B channel, could not handle simultaneous voice/data transmission over a single ISDN circuit.

In addition, the video phones were incompatible and couldn't communicate. Also, the slow-scan video occasionally failed to work and, in general, had poor picture quality. COMSAT officials said they weren't able to bring up the satellite links until the night before the show opened, leaving little time to test equipment.

AT&T demonstrated a personal computer ISDN Basic Rate Interface, an-

(continued on page 63)

Software lets NetView manage NCR Comten FEP

By Tom Smith
New Products Editor

ST. PAUL, Minn. — NCR Comten is scheduled to announce today software that will enable customers to bring NCR Comten front-end processors under the control of IBM's NetView net management system.

The product, Comten Support Facility (CSF), lets customers use standard NetView screens to issue commands, collect error messages and gather usage statistics from NCR Comten 5620 and 56X5 front ends.

The company also upgraded its Advanced Communications Function/Network Control Program (ACF/NCP) to boost performance and improve statistics reporting.

It lets customers use NetView screens to issue commands.

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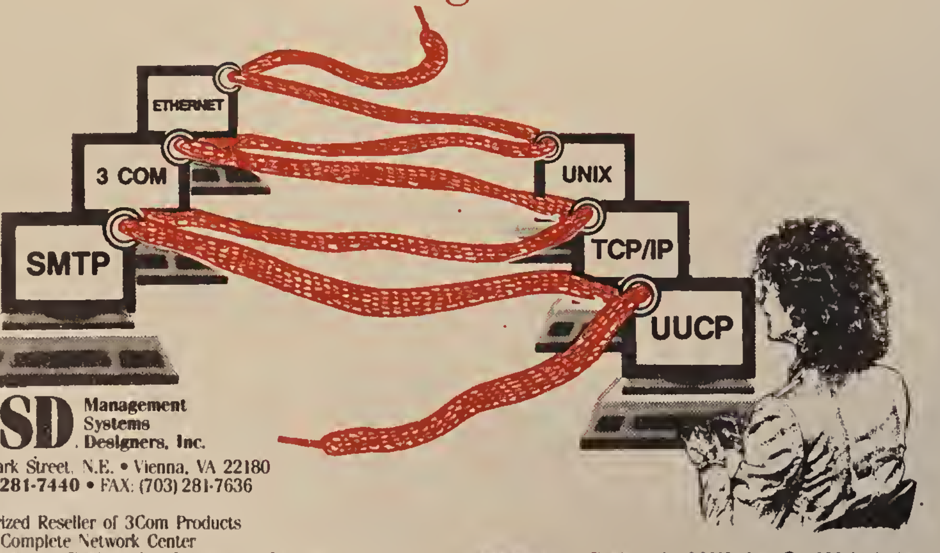
CSF includes two software components: one that runs under the Comten Operating System on the company's front-end processors and the other running above NetView on IBM hosts, according to Linvel Karres, director of the Systems Network Architecture and Multi-Vendor Interconnect Products Program at NCR Comten.

The component on the front end collects statistics from attached devices and provides the duplex link to the component on the host, which in turn provides the interface to NetView. The host software provides statistics to VTAM for historical in-

(continued on page 59)



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See the Faxnet Form on Page #47

Stratus lays out ISDN interface blueprints for its XA2000 minis

By Tom Smith
New Products Editor

MARLBOROUGH, Mass. — Stratus Computer, Inc. last week unveiled plans to develop Integrated Services Digital Network interfaces for its XA2000 Continuous Processing minicomputers.

Providing ISDN interfaces will enable the company to offer its fault-tolerant systems to end users and telephone companies to support applications that take advantage of evolving ISDN telecommunications features such as automatic number identification.

According to John Hart, director of telecommunications industry marketing at Stratus, the company will target its ISDN products at customers in the financial services, security, retail, manufacturing and telecommunications industries.

"We feel very strongly that we can introduce the ISDN technology and strategies in those markets and gain additional market share," Hart said. "Customers would like to see ISDN [applications] implemented on [fault-tolerant processors] because it gives them an advantage in their marketplace."

Stratus is developing both ISDN Primary and Basic Rate Interfaces. The company said its Primary Rate Interface will enable XA2000 systems to be used in high-volume applications, such as telemarketing, while the Basic Rate Interface could be employed in lower volume transaction processing environments, such as automated teller machines.

The Primary Rate Interface divides the capacity of a T-1 line into 23 64K bit/sec voice/data channels and one 64K bit/sec signaling channel. The Basic Rate Interface divides a single telephone line into two 64K bit/sec voice/data channels and a 16K bit/sec signaling channel.

Through its private branch exchange, for example, a brokerage firm could send telephone inquiries regarding a specific commodity along with a screen of data summarizing the calling client's portfolio to traders dealing in that commodity. Calls relating to other commodities could be

(continued on page 61)

AT&T adds to network mgmt. line

By Bob Wallace
Senior Editor

SAN DIEGO — AT&T last week broadened its Trouble Tracker net management product line with the announcement of four applications for the minicomputer-based system that will help users manage PBX nets.

The programs, announced at the Tele-Communications Association, Inc. show here, include a new release of the original Trouble Tracker as well as Trouble Shooter, an expert systems program, and Facilities Tracker, which helps users locate line problems.

The fourth program, Accumaster Integrator Interface, enables users to bring the Trouble Tracker under control of AT&T's Accumaster Integrator, which integrates various product-dependent management systems.

The Trouble Tracker Release 1 Version 2 can handle 800 elements in a network, twice as many devices as the original software package, said Kevin Hanley, AT&T marketing manager.

It has also been expanded to cover AT&T's Generic 1 and Generic 2 Definity 75/85 Communication System private branch exchanges, announced earlier this year. The earlier version, announced in late 1987, supported AT&T's System 75, System 85 and Dimension PBXs.

Sensors attached to the switches detect problems and transmit the alarms over dial-up links to a central Trouble Tracker minicomputer. Trouble Tracker can then route alarms to a number of destinations according to time of day, product, alarm type and trouble description. Users, for example, can have PBX failure alarms forwarded to pagers.

Trouble Tracker runs on an AT&T 3B2/400 computer and uses an Informix SQL data base management system to store alarm information so users can track network performance, product reliability and trends.

Current Trouble Tracker users can upgrade to Release 1 Version 2 for $5,000. The software costs $20,000 and is available now.

Trouble Shooter is an expert systems diagnostic tool that can be used to isolate faults in System 85 and Definity 75/85 Generic 2 switch components. The program can analyze problems from several viewpoints, shortening the trouble isolation process. Because it learns from each problem, the expert system becomes

(continued on page 59)

MCI unveils commercial billing plan

By Anita Taff
Washington Bureau Chief

SAN DIEGO — MCI Communications Corp. last week rolled out a commercial version of a billing management service it is providing to Merrill Lynch & Co., Inc. as part of a multimillion net deal.

The billing service, MCI Portfolio, was unveiled here at the Tele-Communications Association, Inc. (TCA) conference. It provides customers with a consolidated summary report of all services and charges by location and can summarize information by as many as 10 variables, including division, branch, building and office.

Customers can also purchase optional reports that provide more detailed information, such as frequently called numbers, hour-by-hour call distribution and month-by-month comparisons of costs across all locations.

MCI originally offered these custom billing capabilities to Merrill Lynch under a five-year, $150 million contract covering most of the financial services company's domestic and international switched voice and private-line business ("Merrill Lynch to sign MCI as lead carrier," *NW*, June 12).

Also at TCA, MCI announced that this week it will begin offering in 170 cities a new digital private-line service that supports voice and data transmission at speeds up to 56K bit/sec. The carrier announced earlier that it will roll out a fractional T-1 service later this year.

(continued on page 58)

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Small Telenet switch supports multiple protocols at same time

Downsized switch offers more features than some larger PBXs.

By Anita Taff
Washington Bureau Chief

SAN DIEGO — Telenet Communications Corp., a division of US Sprint Communications Co., last week unveiled a downsized packet switch at the Tele-Communications Association, Inc. show here that can support multiple protocols simultaneously on different ports.

The new switch, the TP8000, weighs 35 pounds and is small enough to fit on a desktop, but Telenet claims it has more features than many larger packet switches. Although Telenet declined to provide any pricing information, it said the unit will enable users to extend a rich set of capabilities to smaller regional offices.

The TP8000 is based on a 32-bit processor, has a throughput of 400 packet/sec and comes with 2M bytes of memory, which can be upgraded to 8M bytes. In addition to the data concentration, protocol conversion and switching capabilities typically provided by other products, the new switch can manage up to six protocols simultaneously across eight or 16 ports.

Each port can be dynamically reconfigured, allowing users to change the protocols supported by a single port without taking the unit out of service, Telenet said. According to the company, other manufacturers require that groups of ports be dedicated to a single protocol and that the entire switch be brought down to modify protocol support.

Initially, the TP8000 will support X.25, X.32, X.3, X.28, X.29 and 3270 Binary Synchronous Communications protocols. Additional protocol support will be added in the future for Integrated Services Digital Network and Frame Relay.

John Holmblad, vice-president and general manager of network systems at Te-

(continued on page 58)

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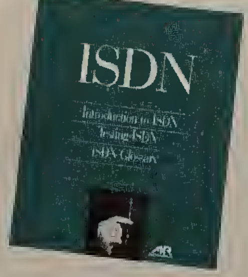

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AT&T targets Europe with Istel buyout

continued from page 1

majority shareholders, management and employees. Financially, the deal is the largest ever for AT&T, eclipsing the carrier's March 1989 acquisition of Paradyne Corp. for $250 million. AT&T plans to pay cash for Istel.

AT&T executives said the purchase, the carrier's first in the U.K., will give the company access to large European users and make it more competitive abroad. The move, which could serve as a springboard for similar acquisitions in other parts of Europe and Asia, gels with the carrier's strategy of expanding existing services worldwide and reaping 20% of the revenue from overseas activities by the mid-1990s.

"The acquisition will accelerate our progress in providing value-added network services to our international customers," said John Berndt, president of AT&T International Communications Services.

The acquisition comes on the heels of British Telecommunications PLC's move to acquire McDonnell Douglas Corp.'s Network Systems Co., which operates the U.S.-based Tymnet public data network ("British Tel snaps up Tymnet, other assets," *NW,* Aug.7). British Telecom, the U.K.'s largest long-distance company, offered $355 million to acquire the company and expand its presence in the U.S.

"The deals are similar [in that] AT&T is gaining a bigger presence on British Telecom's side of the ocean," said David Boczar, assistant vice-president and a telecommunications analyst at New Japan Securities International, Inc. in New York. "I don't see AT&T's move as a response to the British Telecom deal. It's reflective of AT&T's aggressiveness in the market."

Walter Ulrich, client services director for the Information and Telecommunications Systems Practice at Arthur D. Little, Inc., a Cambridge, Mass.-based consulting firm, agreed. "AT&T needs to enhance its positioning overseas if it's going to compete in the global market in the '90s."

AT&T plans to exploit Istel's systems integration expertise in the U.K. as an added service to its customers. Istel manages data center operations, data networks and provides industry-specific value-added networks and applications. "[The acquisition] will substantially strengthen our position in the U.K.," AT&T's Berndt said.

Gregory Sawers, a telecommunications analyst at the New York-based brokerage firm of Sanford C. Bernstein & Co., said, "The acquisition would allow AT&T to offer more products to big U.S.-based companies building international networks. If a company wanted a data network in the U.S. and a data network in the U.K., AT&T would be able to offer that and link the two networks together."

Istel Chairman John Leighfield called the marriage "a perfect match."

Istel will have access to AT&T's huge customer base and global telecommunications network. AT&T also has established relationships with telecommunications administrations throughout the world that will help Istel expand its geographic reach. AT&T's financial strength and research and development resources promise to help Istel expand its offerings as well.

Under terms of the agreement, Istel will become a wholly owned subsidiary of AT&T and will have no change in its name or management. Istel, which does not disclose financial details, is expected to make about $12 million this year, analysts predicted.

AT&T unites data network control tools

By Paul Desmond
Senior Writer

SAN DIEGO — In a move to unify its two separate product lines, AT&T Paradyne last week introduced a network management system that integrates existing AT&T and Paradyne Corp. net management tools.

The new 6800 Series Network Management Systems (NMS), announced at the Tele-Communications Association, Inc. conference here, accepts alarms and diagnostic data from the current Paradyne Analysis 6510 and AT&T Dataphone II Level IV net management systems.

In addition, the 6800 will support an Open Systems Interconnection-compatible link to Accumaster Integrator, the keystone of AT&T's Unified Network Management Architecture (UNMA). Accumaster Integrator will tie together net management products from multiple vendors.

The 6800 NMS manages the full array of AT&T Paradyne data communications equipment, including analog private-line modems, data service units, statistical multiplexers and T-1 multiplexers.

> The 6800 NMS will support an OSI-compatible link to Accumaster Integrator.
>
> ▲▲▲

John Miller, executive vice-president of product business units for AT&T Paradyne, said the 6800 NMS will play a key role in the company's efforts to merge the AT&T and Paradyne product lines while continuing to support the companies' existing equipment.

The low-end NMS Model 6830 runs on an AT&T Unix-based 6386 Work Group System workstation, while the high-end NMS 6830 runs on a Unix-based AT&T 3B2 minicomputer and uses an attached workstation supporting a graphical user interface. Miller said the interface is similar to Accumaster Integrator's, in keeping with the UNMA strategy of providing a common user interface to all network management tools.

Miller said the 6800 NMS provides features not included in the products it integrates. Those features include the ability to program automated responses to network alerts and an Automatic Trouble Reporting feature that automatically places a call to the appropriate service center when conditions exceed a user-defined threshold.

In addition, the 6800 NMS will provide the first fully Network Management Protocol (NMP)-compliant interface to Accumaster Integrator, Miller said. NMP is AT&T's version of the emerging OSI Common Management Information Protocol (CMIP).

The 6800 system is expected to communicate with Accumaster Integrator using NMP, which AT&T has pledged to tailor for full compatibility with the final version of CMIP.

AT&T Paradyne has also developed a new proprietary protocol, dubbed Advanced Diagnostic Protocol, which the 6800 NMS will use to collect information from the company's future products. That will obviate the need to link equipment to the 6800 NMS through the 6510 or Dataphone II products, Miller said.

Those products use different proprietary protocols for collecting network management data from attached devices.

Besides merging those proprietary protocols into a single protocol that will support all future AT&T Paradyne data communications products, Advanced Diagnostic Protocol provides added functionality, such as faster polling of attached devices, he said.

The NMS 6820 supports up to 1,000 data communications devices and ranges in price from $33,700 to $50,700. The NMS 6830 supports up to 10,000 devices and costs between $116,700 and $146,700. Both will be available in the first quarter of 1990.

The Accumaster Integrator link will also be available in the first quarter next year, Miller said. ◪

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NetView interface gets mixed reactions

continued from page 1

But NetCenter appeared to be the biggest draw. One NetView user, who requested anonymity, said she was impressed with the interface but had some questions.

"I loved what it could do, but when are they shipping it? How much will it cost? Who have they sold it to?" asked the user, who works for a telecommunications service provider whose clients include large financial institutions.

NetCenter, which consists of software components that run concurrently on a DOS-based personal computer or Personal System/2 and an IBM host, allows users to create a graphical representation of the network that can be superimposed on the maps provided with the product.

Its Inventory Information Manager component also lets users store data about each network device, such as its serial number, location, who maintains it and who should be called if the device fails. That data is stored in a data base on the mainframe, said Gary Byrd, an IBM marketing support representative.

Device status is denoted by various colors and, when a failure is detected, users can click on the failed device to retrieve the information stored in the Information Manager, Byrd said. NetView's hardware monitor component — formerly Network Problem Determination Application — will also provide information on the probable cause of the failure, if that can be ascertained, he said.

Some users said the device isn't simple enough to use, complaining that it requires users to scroll through various detail levels to get to a specific device.

"When you have thousands and thousands of lines, you can't go through a tree structure to find a problem," said Peter Studer, president and managing director of Studer Electronic AG, a systems integrator in Schweiz, Switzerland. Studer was at the show looking for tools to help monitor the Swiss Post, Telegraph and Telephone administration's internal network.

"We need to be able to get a trouble ticket that says there's an error, where it is and who's responsible," he said.

Studer also said the product does not provide statistics on line utilization, which should be integrated with the graphical display so users can tell easily if their network is configured in the most efficient way. That is a feature analysts have said could be provided if a repository was included under NetView.

NetCenter also stops short of giving users access to NetView's Session Awareness Data, which monitors sessions between logical units, Byrd said.

But NetCenter allows up to three concurrent 3270 sessions with the host, one of which can be used to access NetView session data using the text interface.

He declined to say whether IBM is planning to integrate access to session data into its graphical interface but said such a feature would "certainly be nice." However, IBM will migrate NetCenter to an OS/2-based workstation, Byrd said.

In general, those who saw the demonstration agreed NetCenter was a big improvement over the text-based NetView interface. "IBM needed this to get up to modern standards," said Gary Loitz, a principal with the Fremont, Calif., consultancy Current Design. "It's a big improvement compared to the text monitors IBM demonstrated at the last [TCA] show."

Another enhanced product IBM demonstrated was the OS/2 version of NetView/PC, which is starting to fulfill its promise of two-way support for non-IBM devices from the NetView console.

For example, IBM demonstrated the Network management Access Program (NAP) developed by Carl Vanderbeek & Associates of San Juan Capistrano, Calif., one of IBM's recently announced business partners. NAP helps users generate NetView/PC applications that let them monitor and control non-IBM equipment from NetView.

During the demonstration, NetView/PC was running a NAP application that supported links to a Digital Equipment Corp. DECnet network. NetView/PC was linked via a 9.6K bit/sec line to an IBM host in Raleigh, N.C., running NetView. A DEC VAX, also in Raleigh, was linked via a dial-up link to the Personal System/2 running NetView/PC at IBM's TCA booth.

Carl Vanderbeek, president of Vanderbeek & Associates, demonstrated how the NAP DECnet application collects VAX event messages and allows the NetView console operator to respond to the events by asking for statistical information or doing "anything a VAX operator can do."

He said the NetView operator has to use VAX command structures when requesting data from the VAX but that help screens are provided. In addition, NAP helps users write programs to automate responses to VAX error conditions, Vanderbeek said.

That application was in stark contrast to last year's multivendor NetView/PC demonstration at TCA, when little of the two-way function that the OS/2 version of NetView/PC promises was demonstrated.

Running on the same Personal System/2 as Vanderbeek's NAP was IBM's interface to its LAN Manager local net analyzer and the NetWatch Monitor Application (NMA) from TelWatch, Inc. of Boulder, Colo. NMA provides a NetView/PC interface to TelWatch's NetWatch, a tool for monitoring the status of analog and digital telecommunications lines.

NMA passes information on existing or potential line problems to the NetView operator, who in turn can request more detailed information such as a summary of the most recent alerts on a particular line.

Users, however, are still wary about NetView/PC. "The jury's still out" on NetView/PC, said Bob Overstreet, senior manager of network support services for MCI Communications Corp.'s internal net. ☐

We Put The Future Of V.32 Modems On The Desktop.

Photograph: The Bettman Archive.

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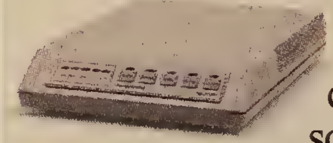

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

> "No news is good news about US Sprint's billing system. We've only been hearing silence, and that's because Sprint has turned it around."
>
> **Bill Rahe**
> President
> The Aries Group/MPSG
> Rockville, Md.

People & Positions

Network Equipment Technologies, Inc. (NET), a Redwood City, Calif.-based maker of T-1 multiplexers and other networking equipment, last week named **John Eddon** vice-president of its European operations.

Eddon's responsibilities include overseeing all NET operations in Europe from NET, Ltd., the firm's U.K.-based subsidiary in Sussex, England.

Previously, Eddon was vice-president of worldwide marketing for Timeplex, Inc.

James Cannavino, IBM vice-president and president of IBM Entry Systems Division, was named to the additional post of general manager for IBM's Personal Systems line of business.

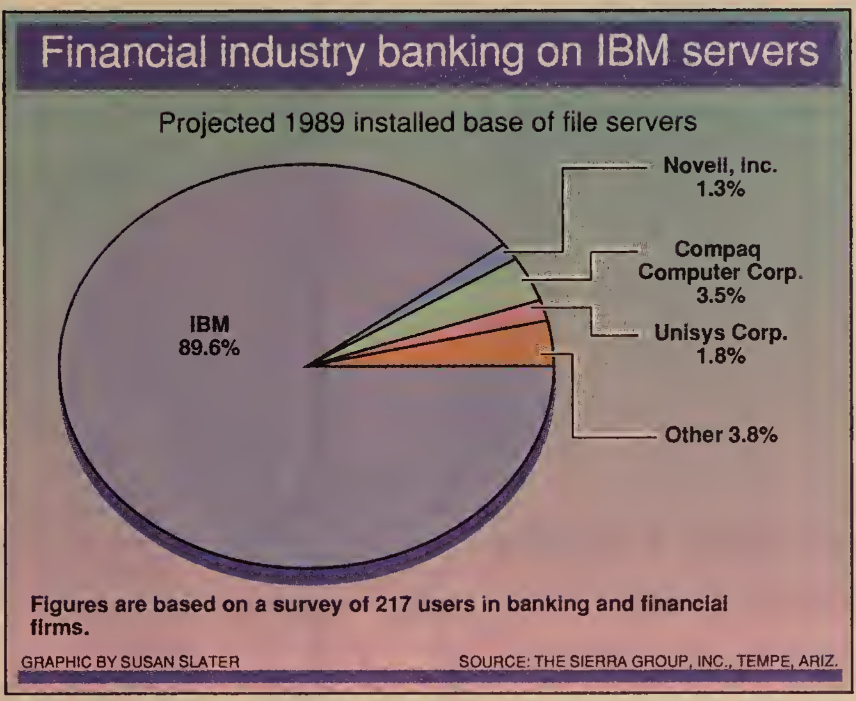
Cannavino will report to **Terry Lautenbach,** senior vice-president and general manager for IBM in the U.S. He succeeds **Richard Gerstner,** who was named to an unspecified special assignment.

Cannavino is expected to bring considerable technical knowledge and experience to the Personal Systems line, which includes both workstations and personal computers.

Arthur D. Little, Inc. last week named **Walter Ulrich** client services director for its Information and Telecommunications Systems Practice.

In his new position, Ulrich will be responsible for developing, marketing and conducting consulting programs.

Previously, Ulrich was a partner in the management consulting services division of Coopers & Lybrand.


Financial industry banking on IBM servers

Projected 1989 installed base of file servers

Figures are based on a survey of 217 users in banking and financial firms.

GRAPHIC BY SUSAN SLATER

SOURCE: THE SIERRA GROUP, INC., TEMPE, ARIZ.

Sears turns to LAN services to lure corporate net users

Plan aims to provide total package for users.

By Gail Runnoe
Washington Correspondent

CHICAGO — In an effort to broaden its appeal to corporate users, Sears Business Centers has refocused its personal computer retail business to sell local net services directly to customers.

Earlier this year, Sears Business Centers embarked upon a strategy shift by offering a wide range of local network services — from installation to service and support — for small and midsize businesses.

The company's new Sears pLAN strategy offers corporate customers local network equipment and services, along with computer hardware for DOS, OS/2 and Unix networked environments. While the strategy stresses direct ties to users, Sears Business Centers still operates almost 60 retail centers to serve smaller businesses.

"In the past, we did bits and pieces of the local networking job. Now we offer customers a total package," said William Lenahan, vice-president and general manager of the chain. The company is willing to provide a custom turnkey local net to users, or a piecemeal package.

PLAN provides customers with assistance in four areas: network planning, installation, operation and maintenance.

On the planning side, Sears Business Centers created a workbook called the Network pLANning Guide, which is designed to provide an analysis of a user's business and net needs.

Once a user has identified its network needs, Sears Business Centers will step in to configure network hardware, provide setup and diagnostic testing, and configure and install network operating systems, Lenahan said.

Sears Business Centers will also provide operational support in the form of routine administrative help, such as adding and removing users, and monitoring network activity and planning for net upgrades and expansion.

Sears Business Centers still remains an authorized dealer for AT&T, Compaq Computer Corp., Epson Corp., Hewlett-Packard Co., IBM, NEC Corp. and Toshiba Corp.

Sears' William Lenahan

The company also resells Novell, Inc.'s NetWare and plans to offer NetWare 386 in the near future. Sears Business Centers recently cut a deal with Cabletron Systems, Inc. to sell that vendor's Ethernet and token-ring twisted-pair coaxial cabling systems.

Sears Business Centers also said it will resell IBM's OS/2 Extended Edition, which is IBM's implementation of Microsoft Corp.'s LAN Manager.

Under the pLAN strategy, Sears Business Centers' total sales have increased by 70%, Lenahan said.

John Maxwell, vice-president at Dillon, Read and Co., Inc.,

(continued on page 14)

Demand to rise soon for ISDN station gear

The big seller is the Basic Rate Interface terminal adapter, which lets users experiment with ISDN.

By Bob Brown
Senior Editor

Although demand for ISDN station equipment is picking up and expected to grow briskly through the mid-1990s, prices remain high and users are wary about investing in the technology, analysts said.

The largest segment of the nascent Integrated Services Digital Network station equipment market is for terminal adapters, add-on devices for telephones and personal computers that support the ISDN Basic Rate Interface.

But sales of off-the-shelf Basic Rate Interface-compatible telephones, data terminals and integrated voice/data terminals are expected to overtake sales of terminal adapters within a few years, analysts said.

The biggest players in the ISDN station equipment market are expected to be the vendors that control the current non-ISDN station equipment market and include AT&T, Northern Telecom, Inc., NEC Corp. and Fujitsu Network Switching of America.

Terminal adapters are leading the market today because they let users experiment with the technology while waiting for standards to gel and services to become more prevalent.

The ISDN adapters enable desktop devices to terminate Basic Rate Interface lines, which support two 64K bit/sec bearer channels for voice or data and a 16K bit/sec channel for signaling.

Terminal adapters let users ease into using ISDN, said Prem Talreja, vice-president of consulting services for Able Telecommunications, Inc., a consulting and market research firm in Milpitas, Calif.

"Not many users are ready to make a long-term commitment to ISDN yet," Talreja said. "Terminal adapters fill a gap between trying ISDN out and becoming fully committed to it."

Up and down

The market for adapters is expected to grow steadily through 1994 and then decline in the later part of the century as sales of ISDN voice/data terminals take

(continued on page 14)

INDUSTRY BRIEFS

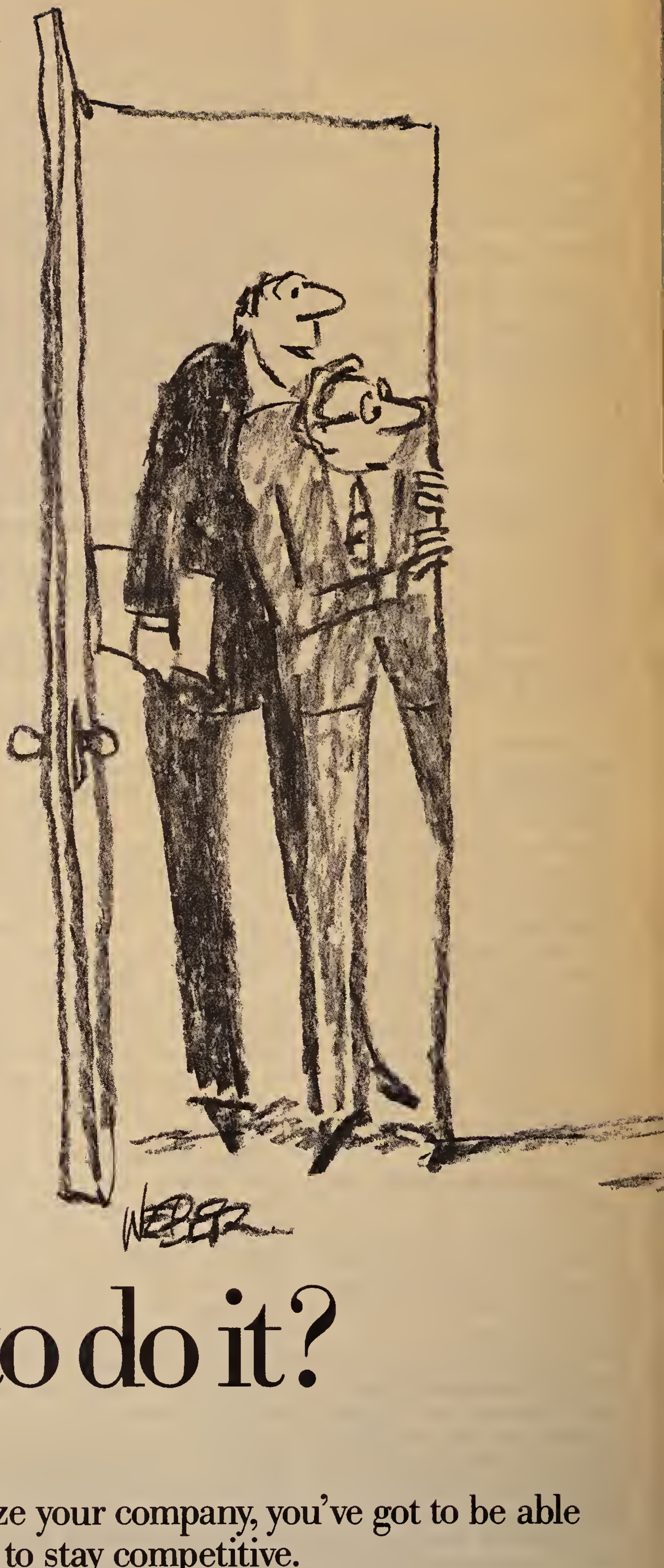
IBM Chairman John Akers last week said the company does not expect to meet third-quarter earnings estimates predicted by security analysts. Earnings will probably be lower than expected, primarily due to the effects of transitioning new products, a customer trend toward leasing rather than buying equipment and continuing strength in the U.S. dollar, Akers said.

Full-year results could also come in under analysts' expectations if more customers choose to lease IBM equipment and if the dollar remains strong, he added.

Lotus Development Corp. last week said it will acquire a 15% interest in **Sybase, Inc.,** and the two companies will jointly develop, market and distribute future products.

The first of those products, currently under development, is an SQL Server driver that will let Lotus 1-2-3 Release 3 users access, query and update a SQL Server data base through an interface called Datalens. The deal also includes a provision for Emeryville, Calif.-based Sybase to sell an additional 10% of the company to Lotus, based in Cambridge, Mass., at a later date. Financial terms of the agreement were not disclosed.

Oracle Corp., a Belmont, Calif.-based relational data base management software maker, last week reported record first-quarter earnings and revenue. Earnings for the first quarter ended Aug. 31 jumped 65% to $12 million compared to $7 million in the first quarter last year. First-quarter revenue rose 94% to $175 million compared to $91 million for last year's corresponding quarter. Lawrence Ellison, Oracle's president and chief executive officer, said sales of portable applications products were especially strong for the first quarter.



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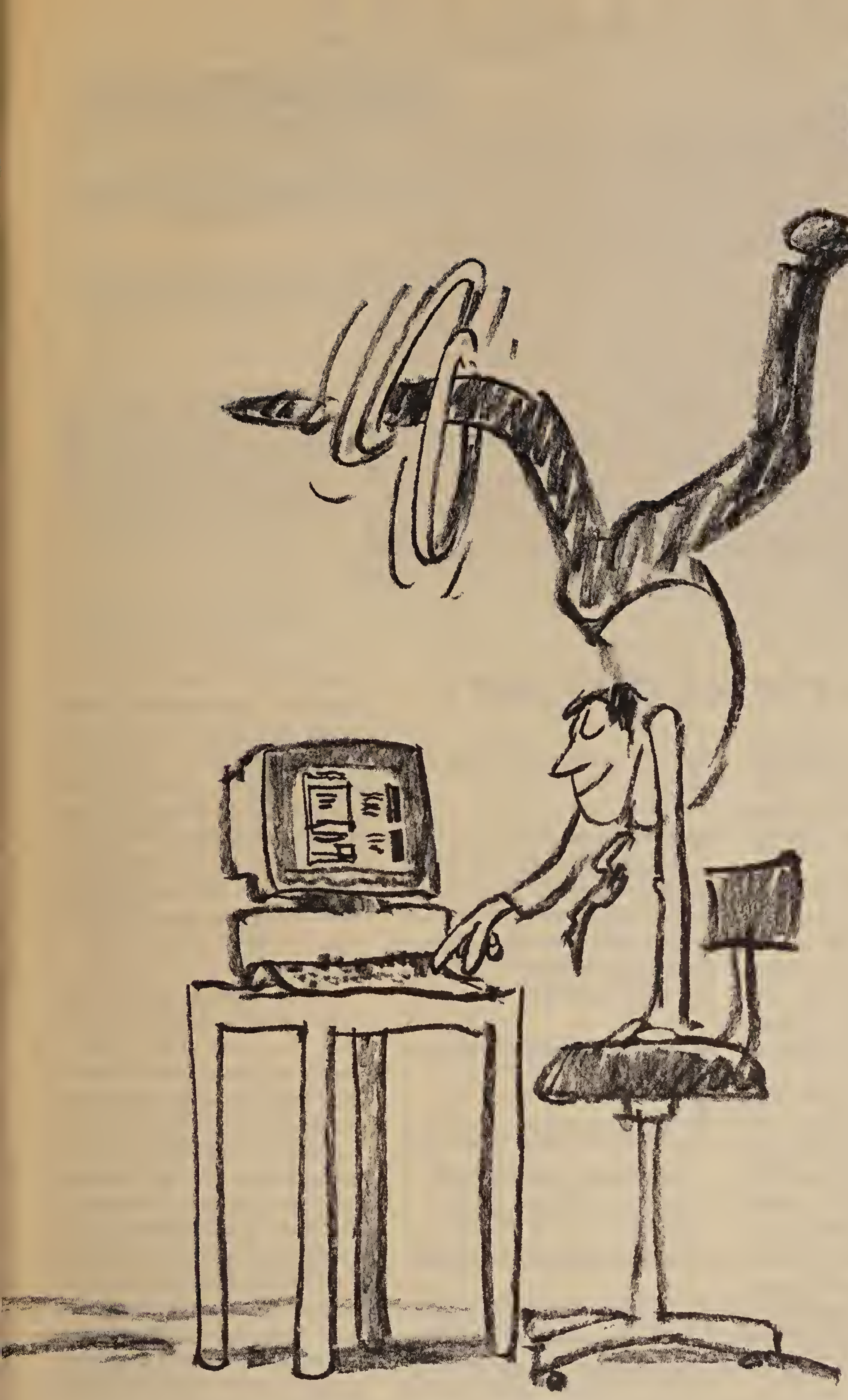

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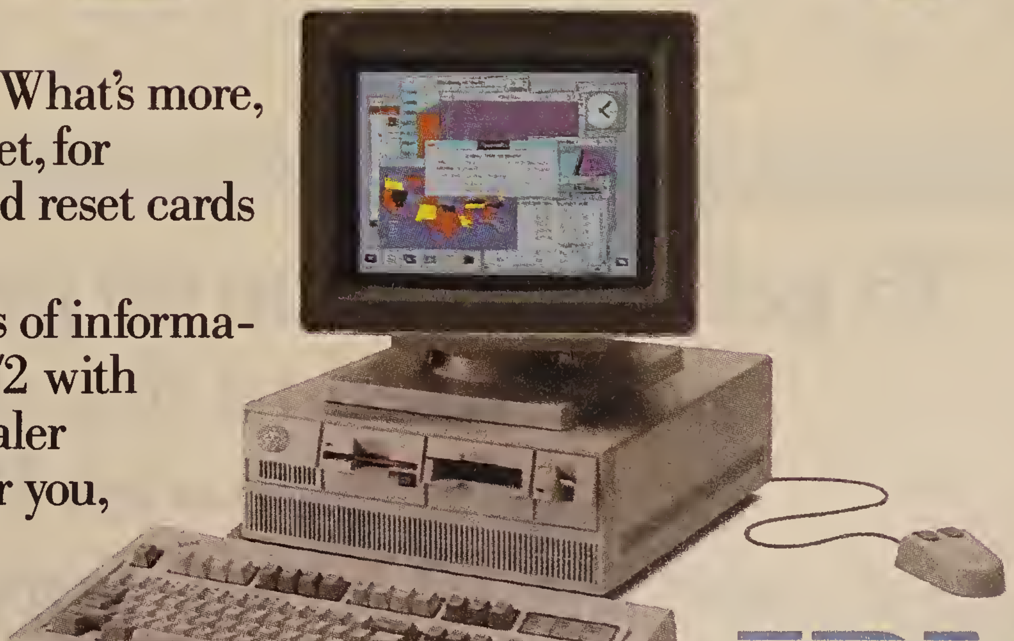

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Second-tier carriers tout billing plans

**By Bob Brown
and Gail Runnoe**
Network World Staff

Users who cannot get the billing services they need from the three major carriers should take a look at the billing options offered by some of the smaller national or regional long-distance carriers, industry watchers say.

Lately, billing has become an important competitive consideration for AT&T, MCI Communications Corp. and US Sprint Communications Co. as the quality and price of their services become more even ("Big carriers do battle on billing turf," *NW*, Sept. 25).

A concern of big and small

Recognition of billing importance to users extends beyond the Big Three. Analysts say second-tier long-distance carriers can be quite flexible in billing.

"Small [carriers] have sometimes been able to offer better and more flexible bills because they only price for a certain region," said Robert Self, founder of Market Dynamics, a New York-based telecommunications consulting firm. "The big guys use national average pricing."

Bill Rahe, president of The Aries Group/MPSG, a Rockville, Md.-based market research and consulting firm, agreed that smaller and regional carriers have a chance to attract business with their billing options.

"I don't think billing will do it alone," Rahe said, "but by offering a broad range of billing options and by being more responsive to customer needs, carriers like Telecom*USA, [Inc.] and [Williams Telecommunications Group, Inc.] can compete with their bigger rivals."

Tailored to fit

According to Mark Kaiser, vice-president of marketing at Telecom*USA in Atlanta, offering custom-tailored management reports helps the company differentiate itself from other carriers. Telecom*USA, a holding company for regional carriers SouthernNet, Inc. and Teleconnect Co., offers between 40 and 50 management reports.

"We've strategically focused on billing," Kaiser said. "We excel at assisting companies that don't have telecom managers but are significant users. We provide a kind of consulting service" to help users manage their bills.

Telecom*USA can provide customers with their bills on a variety of media, including paper, magnetic tape or floppy disks for personal computers. Bills on electronic media have fast turnaround times, Kaiser said. They are prepared within two days after the end of the billing cycle and shipped by overnight mail to the customer, he added.

The personal computer-based offering is priced at $100 per month, Kaiser said.

Telecom*USA billing features include call detail, authorization codes, 800 detail (by city and hour) and the client billing option, which puts bills from multiple locations into a single master billing account for the benefit of volume discounts.

"The more the customer understands the service and the more information they have, the better off they will be and the better off we will be," Kaiser said. "It [should] be a win-win relationship." ◪

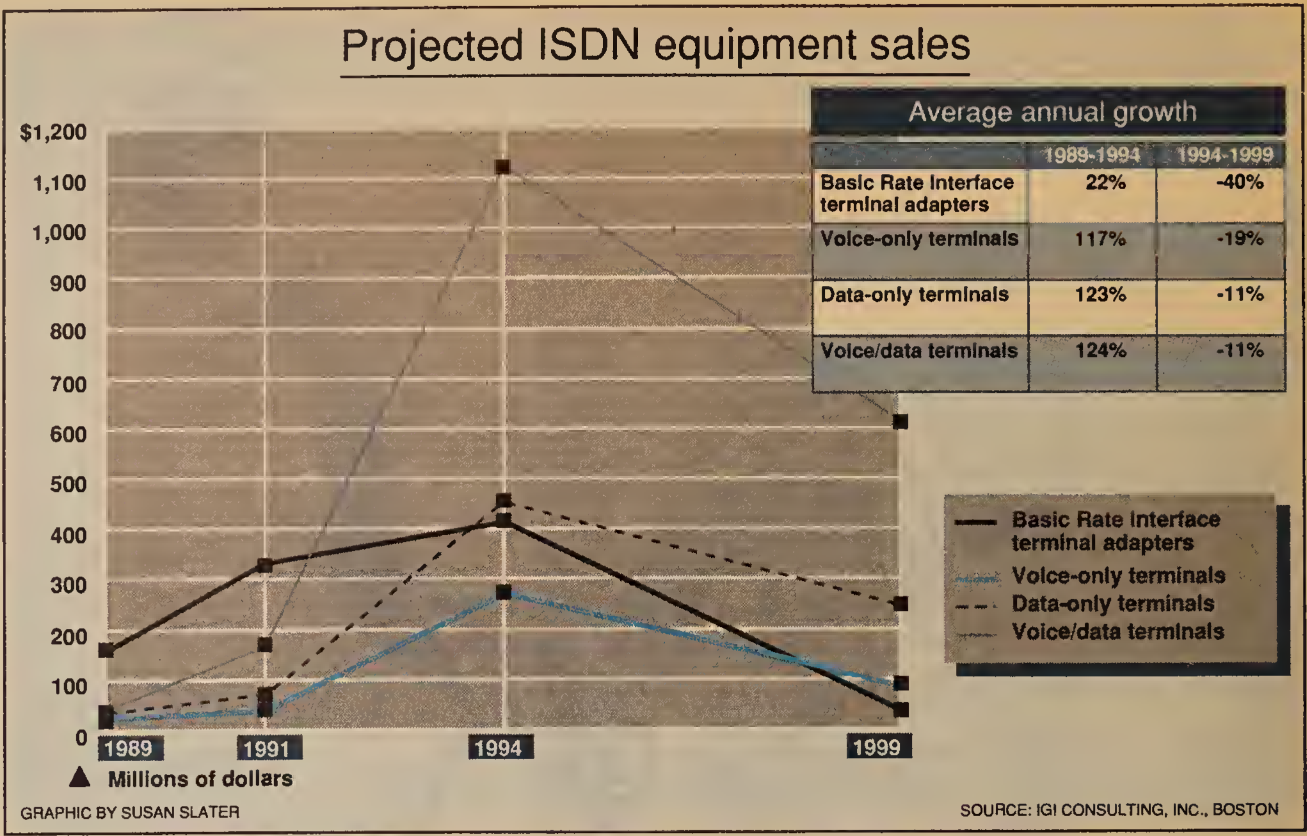
Sears turns to LAN services

continued from page 11

a New York-based investment banking firm, said a number of Sears' competitors, such as Businessland, Inc., are also focusing on networking and have a strong national presence.

"It's not just the ability to have a number of locations that's important," he said. "You also have to have an appropriate strategy, a full range of authorized dealers and market expertise."

Maxwell said Sears Business Centers falls short in these areas, and its chances are slim. ◪



Projected ISDN equipment sales

Average annual growth

	1989-1994	1994-1999
Basic Rate Interface terminal adapters	22%	-40%
Voice-only terminals	117%	-19%
Data-only terminals	123%	-11%
Voice/data terminals	124%	-11%

GRAPHIC BY SUSAN SLATER

SOURCE: IGI CONSULTING, INC., BOSTON

Demand to rise for ISDN gear

continued from page 11

off, according to a recent report from IGI Consulting, Inc., a Boston-based publisher of reports on high technology (see graphic, this page).

About $153 million worth of terminal adapters are expected to be sold this year as ISDN services proliferate, said Lawrence Gasman, project director for the study. But that number is expected to shrink to $32 million by 1999.

Only $20 million worth of integrated terminals are expected to be sold this year, but sales should top the $1 billion mark by 1994, Gasman said. By 1999, sales of these devices are expected to settle down to $618 million per year as the products become commodity-like, the report said.

"What we're going to see in this market is very typical of other high-technology markets," Gasman said. "The price for ISDN terminals and terminal adapters is high, but as demand starts to grow, prices will fall. Prices will eventually fall further than demand increases, and that's when this equipment will become commodity offerings."

Market projections, however, vary greatly. Able Telecommunications, for example, estimates that the terminal adapter market will only reach $62 million this year.

Optimistic outlook

Gasman projected it will be another year before sales of full-fledged ISDN terminals begin to take off; but after that, the market should grow at better than 100% a year through 1994. He warned, however, that the figure appears more impressive than it is because of the small beginning base.

> Gasman said it will be another year before sales of full-fledged ISDN terminals take off.
>
> ▲▲▲

ISDN terminals are expected to be used initially for voice capabilities because most users have little need for the data capabilities, Gasman said.

AT&T, however, said its ISDN voice/data telephones, such as the ISDN 7506 Display Terminal, are selling well.

Although the market is new, users are expected to buy ISDN station equipment from established players in the non-ISDN station equipment market, such as AT&T and Northern Telecom, Inc., according to Able Telecommunications' Talreja. This is despite the fact that much of the ISDN station equipment on the market is fairly equal in capabilities, he said.

"While there is demand for [ISDN station equipment] already, the point to be noted is that the majority of the demand is being supplied by one or two major vendors," Talreja said.

AT&T and Northern Telecom have an inside track in the station equipment market because of field trials of their ISDN private branch exchanges and central office switches, analysts said. That could be significant for users because AT&T and Northern Telecom could set pricing standards until lower cost producers flood the market.

"Demand is not as high as we'd like to see it," said Dean Wolf, manager of product marketing for ISDN station equipment at Fujitsu. "Most [user] companies are moving cautiously toward ISDN."

But the pace for Fujitsu's ISDN products sales, especially for its high-end terminal adapters, is picking up, Wolf said. ◪

To get information on products or services
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TELECOMMUNICATIONS

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Worth Noting

Digital Microwave Corp. last week shipped its 10,000th microwave radio to Cantel, a Toronto-based cellular service provider. To commemorate the event, Digital Microwave awarded Cantel a gold-plated microwave transceiver and a complete 23-GHz short-haul microwave system.

Carrier Watch

Pacific Bell recently announced an agreement to provide 800 Integrated Services Digital Network Basic Rate Interface lines to an AT&T complex in Sunnyvale, Calif.

The ISDN lines are part of a 1,200-line digital Centrex, the second ISDN Centrex contract the company has landed. In November, the company completed a similar agreement with the city of Fresno, Calif.

An AT&T 5ESS ISDN Remote Switching Module (RSM) will be located in AT&T's complex to support the ISDN Basic Rate Interface lines. Thirteen T-1 lines will tie the RSM to the 5ESS central office switch in Pacific Bell's Sunnyvale central office. Pacific Bell declined to release the value of the contract. Among the services the carrier will provide are circuit- and packet-switching, and an ISDN Centrex management system that will support near-real-time moves and changes of lines.

Pacific Bell will provide ISDN station equipment under a separate agreement.

ACC Long Distance Corp. of Rochester, N.Y., recently announced plans to provide long-distance services to customers throughout the Poughkeepsie, N.Y., region beginning Oct. 1. Along with outgoing long-distance service, ACC will offer international calling, inbound 800 services and operator services. ◻

US Sprint offers best rates for medium-sized firms

Report compares rates for five major carriers.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — US Sprint Communications Co. offers the best phone rates for firms spending between $1,750 and $8,000 per month on long distance, according to a new report released by the Telecommunications Research and Action Center (TRAC).

The research firm, based here, compared rates from AT&T, US Sprint, MCI Communications Corp., Cable & Wireless Long Distance and ITT Corp. Charges were computed according to three representative monthly spending levels: $6,500, $3,500 and $1,750.

US Sprint's Dial 1 WATS service was 14% less than AT&T's Pro WATS on monthly charges of $1,750, 16% less for charges of $3,500 and 19% less for charges of $6,500.

US Sprint was also less expensive than MCI, costing 12% less on monthly charges of $1,850, 10.5% less on charges of $3,500 and 10.8% less on charges of $6,500.

MCI has the lowest rates for users spending $700 or less per month on long-distance service, the report found.

David Wagenhauser, staff attorney for TRAC, said the group has seen a high level of rate churn in the long-distance market over the past few years. Since TRAC's last report in November, several of the carriers with the lowest prices have since been underpriced by rival carriers, he said.

> MCI has the lowest rates for users spending $700 or less per month on long-distance service.

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The biggest changes were in the low-end services targeted at users who spend between $150 and $350 per month, Wagenhauser said. MCI, ITT and US Sprint have been particularly aggressive in lowering prices in that market, which has resulted in

(continued on page 16)

WASHINGTON UPDATE

BY ANITA TAFF

Time for a unified approach. Sounding the theme of global competitiveness, U.S. Rep. Edward Markey (D-Mass.), chairman of the House Subcommittee on Telecommunications and Finance, is calling on the White House to step up efforts to develop a national telecommunications policy.

"It is long beyond the time when we can have a disjointed and unproductive approach" to telecommunications, said Markey at a recent authorization hearing for the National Telecommunications and Information Administration. The NTIA is the chief advisory group to the president on telecommunications policy.

Markey urged Janice Obuchowski, the new head of the NTIA, to impress on the administration the importance of telecommunications to the U.S. economy. He asked for support from the White House in developing policies on a number of major issues now pending before Congress: lifting the Modified Final Judgment restrictions, building a national supercomputer network and cross-ownership of telephone and cable television companies.

According to Markey, Congress has had to proceed on these matters alone "in light of the administration's apparent inability to map a clear course for our telecommunications future."

Obuchowski pledged her support for Congress' efforts, backing in particular the suggestion to lift Modified Final Judgment restrictions. Although the administration has not yet stated its position on the issue, the White House is serious about issues of global competition, she said.

Obuchowski said the NTIA is currently working on a study of

(continued on page 16)

Fractional T-1 price comparisons for six channels

Circuit length (miles)	AT&T's Accunet Spectrum of Digital Services	US Sprint Communications Co.'s Clearline Fractional 1.5		Cable & Wireless Communications, Inc.'s Intelli-Flex	
	Monthly rate	Monthly rate	Savings vs. AT&T	Monthly rate	Savings vs. AT&T
25	$900	$828	8.0%	$1,145	-27.3%
50	$1,305	$1,174	10.0%	$1,183	9.3%
75	$1,491	$1,338	10.3%	$1,448	2.9%
100	$1,678	$1,498	10.7%	$1,487	11.4%
200	$1,860	$1,631	12.3%	$1,639	11.9%
300	$2,042	$1,773	13.2%	$1,792	12.2%
400	$2,224	$1,915	13.9%	$1,945	12.5%
500	$2,406	$2,057	14.5%	$2,098	12.8%
700	$2,770	$2,341	15.5%	$2,404	13.2%
1000	$3,316	$2,767	16.6%	$2,862	13.7%
2000	$5,136	$4,187	18.5%	$4,390	14.5%
3000	$6,956	$5,607	19.4%	$5,918	14.9%

Prices listed are for the interoffice portion of fractional T-1 channels and do not include the cost of local access. AT&T and Cable & Wireless offer fractional T-1 service in 64K bit/sec increments, while US Sprint offers 56K bit/sec increments.

GRAPHIC BY SUSAN SLATER

SOURCE: HTL TELEMANAGEMENT, LTD., BURTONSVILLE, MD.

Amtrak dumps ETN, makes tracks to SDN

Railroad takes advantage of promotion to save installation fees; ends toll fraud with virtual net.

By Bob Wallace
Senior Editor

PHILADELPHIA — In its ongoing drive to cut costs while improving network performance, Amtrak has gradually replaced an electronic tandem network (ETN) with an AT&T Software-Defined Network (SDN).

The train company began using SDN sparingly but took advantage of an AT&T promotion earlier this year that waived installation charges, saving the company $250,000 as it expanded its network tenfold to serve more than 300 sites.

Forty of the sites use dedicated access, and the remainder use switched access, according to Matt Brunk, Amtrak's chief network engineer.

End of the sprawling giant

Amtrak's old network, the Amtrak Telecommunications System (ATS), was a seven-node ETN with a national hub here and regional hubs in Chicago, Jacksonville, Fla., Los Angeles, New Haven, Conn., New York and Washington, D.C.

ATS was anchored by 37 satellite switches and seven main private branch exchanges, including one at its corporate headquarters here. The network included 337 interswitch trunks, 1,600 other trunks and 2,000 local access lines.

Servicing the ETN was a major drain on resources. "Service was poor due to the various routing schemes used by the PBXs, as well as the large number of tie lines," Brunk said. "Quality was distance-sensitive: The further away the dialed number, the higher the degradation in voice transmission."

Calls to ATS sites were completed in one of three ways: over interswitch trunks, over WATS lines or over the public switched network — in that order, Brunk said.

> Servicing the ETN was a drain on resources. "Service was poor due to the various routing schemes used by the PBXs," Brunk said.

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Off-net calls were completed one of four ways. The first method of choice was to send calls over interswitch trunks to the nearest ETN node and then out over WATS lines. The second option was to use toll lines from the remote ETN node. Calls also could be routed from the point of origin over WATS lines or, as a last resort, over the public switched network.

(continued on page 16)

Washington Update

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the marketplace to determine whether the restrictions should be lifted, but added that it isn't productive to place limitations on seven companies that account for about 50% of the capital resources in the market.

AOS watchdog bill passed. A bill to curb abuses by alternative operator services (AOS) providers last week was passed unanimously on a voice vote in the House of Representatives. Two similar bills introduced in the Senate are awaiting hearings.

Rep. Jim Cooper's (D-Tenn.) bill requires AOS providers — firms that provide operator assistance in routing and billing long-distance calls — to label phones they service, have operators identify themselves to callers, provide rate information when requested and transfer calls to other carriers at the caller's request ("AOS firms come under fire in House," *NW*, April 17). It also requires AOS providers to file their rates for Federal Communications Commission review and be able to justify rates the commission deems unjust or unreasonable.

According to Cooper, if the FCC finds that competition in the marketplace is not protecting consumers from unjust rates, the legislation then directs the FCC to conduct an expedited 90-day rulemaking on how to regulate rates for the entire AOS industry.

The two bills introduced in the Senate are from Sen. John Breaux (D-La.) and Sen. Alan Dixon (D-Ill.). ◘

Amtrak dumps ETN, makes tracks to SDN

continued from page 15

The complexity of the network introduced numerous possible points of failure. "Any tie line or PBX outage had a severe impact on the rest of the network, since all PBXs were linked with tie lines," Brunk said.

With private-line rates soaring, Amtrak decided to change courses and optimize the network for cost.

Amtrak converted most of its tie lines to WATS, a Herculean task that required the rewriting of all route selection and alternate rerouting software, Brunk said.

The former ATS routing scheme required as many as seven circuits to complete a single telephone call. After rewriting the software, a typical telephone call required only two circuits. "This improved the call transmission quality, decreased the delay users experienced waiting for the dialed number to ring" and cut communications costs, Brunk said.

While these moves improved the ETN, they did little to eliminate another problem that had plagued the company for years: toll fraud.

In a seven-day period in 1985, hackers tallied $185,000 in unauthorized calls. By the end of the year, the amount of toll fraud reached more than $1 million.

"It was quite a mess there for some time," Brunk recalled. "We had college kids and drug dealers using 800 numbers to access and make calls through our network."

Slowly but surely

Although Brunk had already begun evaluating SDN as a possible replacement for the WATS network, he chose not to use the virtual network service until AT&T announced the SDN Network Remote Access Fraud control feature. The feature enables users to centrally monitor and manage SDN use by authorization codes.

The company began using SDN on a limited basis soon after the feature was announced. It also employed a feature that generates warnings if spending on any user authorization code exceeds $60 per month. "We look into these situations immediately," Brunk said.

Although the security features seemed to stymie fraud, high service installation costs preempted widespread use of SDN. That final hurdle was removed when AT&T announced the promotion waiving installation fees, and the company began migrating all its traffic to the virtual network.

Today, the network serves all of the company's 300 locations and has eliminated almost all toll fraud, Brunk said. ◘

US Sprint offers best rates

continued from page 15

rate reductions of as much as 25% since November, he said.

AT&T has attempted to make its services more attractive by combining its three Pro America plans into one integrated Pro WATS plan, but it still lags behind the others.

"While it has narrowed the price gap with other carriers, AT&T Pro WATS is still out of step with its competitors and is the most expensive plan in every category compared," Wagenhauser said

Due to the frequent fluctuation in long-distance prices, "the business that does not pay close attention to the constant rate changes and introduction of new plans could be burning money," Wagenhauser said.

Charges for all carriers were projected based on 60 sample calls divided equally among short-, medium- and long-distance interstate service in the 48 contiguous states.

Monthly charges of $1,750 were estimated to represent 9,500 calling minutes, charges of $3,500 represented 19,000 calling minutes, and charges of $6,500 represented 38,000 calling minutes.

Seventy percent of the calling minutes were calculated at day rates, 25% were based on evening rates, and the remaining 5% were figured on night and weekend rates. ◘

So much hangs in the balance.
In this business, you can't afford surprises.

Meet Colleen Auchter. Student balloon pilot and Telecommunications Manager for Wang Financial Information Services.

If there's one thing Colleen has learned from her ballooning experience it's this: Be prepared for anything. Anticipate the unexpected. Because when you're thousands of feet in the air, you simply can't afford any surprises. You have to be able to rely on your decision-making skills . . . and your equipment.

The same holds true in Colleen's job at Wang Financial. The decisions she makes in selecting a private-line vendor are absolutely critical. Especially when you consider that Wang Financial uses private lines to supply money managers, banks and brokers with real-time stock market information. At any given moment, vital information that translates into multimillion-dollar transactions is crossing the lines through Wang Financial's SHARK® service. And if there's an interruption in transmission . . . well, that's serious trouble.

Obviously Wang Financial's customers demand consistently reliable service. Wang Financial, in turn, demands the same from **Williams Telecommunications Group (WTG)**. And gets it.

"These circuits are our lifeline. Our business depends on accurate, real-time information," Colleen explains. "We have to go with reliable vendors. And WTG has proven reliability."

The fact is, no other company sets higher standards for availability than WTG. But in Wang Financial's business, where data transmission is critical, they must take every precaution. And that means back-up systems. Just in case. So Colleen counts on WTG to provide Wang Financial with route diversity as well.

"Buying multiple circuits from WTG is efficient and economical," Colleen says. "WTG has the route diversity Wang Financial needs."

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

Contel ASC last week said its second satellite, the ASC-2, will be launched into orbit during the first quarter of 1991. ASC-2 will support two-way data communications via very small aperture terminals, as well as voice and videoconferencing.

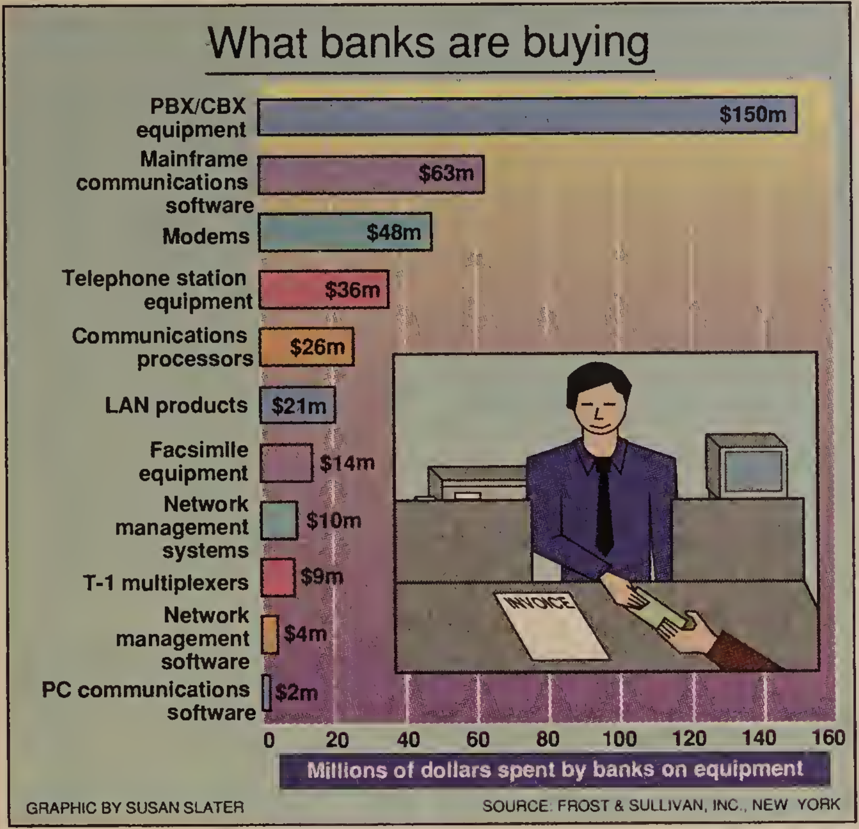
Data Packets

McDonnell Douglas Network Systems Co.'s Tymnet last week announced at the Tele-Communications Association, Inc. show it will install packet switches in 21 domestic cities, enabling users in those areas to access Tymnet via a local dial-up call at speeds up to 2,400 bit/sec.

The new locations include Brooklyn and Queens, N.Y.; Mountain View and Palo Alto, Calif.; Troy, Mich.; and Findlay, Ohio. The company also said it is upgrading its service in 62 other U.S. cities to support 2,400 bit/sec dial-up links, instead of 1,200 bit/sec links. Tymnet now has packet switches in 520 U.S. cities.

StonyBrook Technologies, Inc. last week announced it won a systems integration contract to install a five-node packet network for the Center for Learning Technologies, the technology arm of the Board of Cooperative Education Services (BOCES).

BOCES operates a vocational education program for adults in Suffolk County, N.Y. Under the contract, StonyBrook Technologies will install five EDA Instruments, Inc. packet switches and associated packet assembler/disassemblers in Suffolk County schools. The company will also provide modems that let terminal and microcomputer users in 40 schools dial into the nearest packet switch and gain access to either a BOCES data base or the Dow Jones News Retrieval Service.


What banks are buying

GRAPHIC BY SUSAN SLATER

SOURCE: FROST & SULLIVAN, INC., NEW YORK

Banking evolution brings greater datacom spending

Study: Expenditures to top $1b within 5 years.

By Jim Brown
Senior Editor

NEW YORK — Banks will spend more than $1 billion over the next five years on data networks, according to a recent study published by Frost & Sullivan, Inc.

The study, "Information Communications in Banking in the U.S.," predicts that banks will spend an additional $991 million on private branch exchanges and related telephone equipment over the same period.

> Fundamental to the change is an increased reliance on micros in branch offices.

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"Data communications has always been important to banks, but the banking environment is changing," said Keith Huntley of Huntley Associates, Inc., the Chestertown, Md.-based consulting firm that conducted the study. "Banks are going to have to change their systems" to accommodate the evolution.

Fundamental to the change is an increased reliance on microcomputers in branch offices. To improve customer service, banks are installing microcomputers and tying them to central hosts, an effort called "platform automation."

Use of microcomputers enables employees to access up-to-date customer files from hosts and use microcomputer applications to calculate which bank savings or loan programs are best for the customer.

The advent of microcomputers, typically linked using local networks, is encouraging banks to replace existing hierarchical terminal-to-host networks, which rely too heavily on expensive host processing power.

Having processing power at the branch office opens the door for peer-to-peer communications and allows banks to off-load processing chores to microcomputers.

"As time goes on, there will be more LANs in banks replacing the dumb terminal type of networks," Huntley said. "There is more of a requirement in banking today for distributed networks with distributed intelligence."

How it breaks down

Local network purchases should total $128 million over the next five years. That compares to the $144 million banks are expected to spend on communications processors, $267 million on modems, $201 million on telephone sets, $347 million on host-based communications software and $790 million on PBXs.

Rounding out the projected spending plans, the study predicts that banks will purchase $77 million worth of facsimile equipment, $61 million of net management systems, $51 million of T-1 networking equipment, $22 million of host-based network management software and $13 million of microcomputer-based communications software.

(continued on page 18)

T-1 buyers probe beyond base features

Users now consider net management features, vendor support, stability in purchase decisions.

By Paul Desmond
Senior Writer

As the T-1 multiplexer product lines of different manufacturers grow increasingly similar, vendor support, network management and supplier stability are becoming more important purchase considerations.

Users and analysts said T-1 vendors have to be able to respond quickly to problems, show they have a product architecture and the financial resources necessary to continually enhance their product line and offer a comprehensive network management system.

Although advanced technical features are fast becoming prerequisites rather than options that distinguish one vendor from another, "people are still concerned about [things such as] routing and how quickly you can reestablish connections when you lose a link," according to Jeff Held, a partner at Ernst & Young's Network Strategies consulting practice in Fairfax, Va.

"These days, the major vendors' products all work pretty well," Held said. "Choosing among them is more difficult, but the consequences from the technical side are not as great because they all basically work."

Some of the top T-1 multiplexer vendors include Timeplex, Inc., Network Equipment Technologies, Inc. (NET), Digital Communications Associates, Inc. and Tellabs, Inc.

One area where product differences still help simplify the buying decision is network management. Rockwell International Corp. of Seal Beach, Calif., recently decided to standardize its nationwide T-1 net on NET equipment, in part because of NET's net management system, which is based on a Sun Microsystems, Inc. workstation (see "NET wins bid to supply Rockwell with T-1 muxes," this page).

"We needed a more sophisti-

(continued on page 20)

NET wins bid to supply Rockwell with T-1 muxes

By Tom Smith
New Products Editor

SEAL BEACH, Calif. — Rockwell International Corp. recently picked Network Equipment Technologies, Inc. (NET) to supply the T-1 multiplexers it will use to upgrade its nationwide network after conducting a comprehensive review of available products.

Under terms of the contract, Rockwell will install five Integrated Digital Network Exchange (IDNX)/20s and two IDNX/70s at an estimated cost of $900,000, according to Bob Bystedt, director of telecommunications for Rockwell. The NET equipment will replace point-to-point T-1 multiplexers from Amdahl Corp. and Aydin Computer Systems.

Eventual replacement of all existing Rockwell T-1 equipment could represent $5 million in business for NET, Bystedt said.

The 60-line T-1 network supports the data and long-distance voice transmission needs of some 40 Rockwell sites. Data includes IBM Systems Network Architecture traffic and Transmission Control Protocol/Internet Protocol traffic.

Rockwell opted for the NET devices to obtain network management and multipoint features lacking in its existing Amdahl and Aydin multiplexers, Bystedt said.

A shift to NET equipment will also give Rockwell the ability to centrally manage its multiplexers and circumvent failed T-1 routes by using the IDNX's dynamic T-1 bandwidth allocation and alternate routing capabilities.

Besides building in safety, the upgrade will save the company an estimated $35,000 a month by making it possible to aggregate traffic on the backbone that is now supported with other facilities. Some 500 end users will be added to the new backbone.

"Whenever we need to replace a multiplexer, our long-term strategy is to go to NET, but each replacement or addition has to be individually justified," Bystedt said. "We will stay with NET unless there's some compelling reason why we wouldn't want to."

The first seven IDNXs will be installed in: Dallas, Houston and El Paso, Texas; Kennedy Space Center in Cape Canaveral, Fla.; Duluth, Ga.; and Anaheim and Seal Beach, Calif.

(continued on page 20)

New Amdahl routing bridge links E-nets at T-1 transmission rates

Bridge lets users aggregate Ethernet data with other traffic.

By Jim Brown
Senior Editor

SUNNYVALE, Calif. — Amdahl Corp. recently introduced a routing bridge capable of linking Ethernet local networks over wide-area facilities at speeds ranging from 4.8K to 1.544M bit/sec T-1 rates.

The Network Processor Series (NPS)/2725-200 is the latest addition to Amdahl's NPS/2700 product family. It can also be used to integrate Ethernet networks into backbone T-1 networks supported by Amdahl NPS/2745 Resource Processors.

Linking the NPS/2725-200 to a T-1 network enables users to integrate traffic destined for remote Ethernets onto the same T-1 backbone supporting circuit-switched voice and packet-switched data, eliminating the need for independent bridging facilities.

The NPS/2725-200 operates at the media access control layer of the Open System Interconnection seven-layer model, allowing devices attached to different Ethernets to do such things as transfer files, exchange electronic mail or share data as long as both support the same networking protocols.

For instance, the NPS/2725-200 enables a device running Transmission Control Protocol/Internet Protocol on one Ethernet to communicate with another TCP/IP-compatible device attached to a remote Ethernet.

The NPS/2725-200 supports two Ethernet interfaces and two wide-area network interfaces, including RS-422, RS-449, V.11, V.35 or X.21. Local Ethernets can communicate through the routing bridge locally, share a single wide-area port or share both wide-area links. In the future, the product will support a connection to IBM Token-Ring Networks.

The bridge supports routing tables, meaning it does not have to broadcast packets over all available links to reach the intended destination.

The NPS/2725-200 supports Amdahl's implementation of the Spanning Tree Protocol, an algorithm that allows the bridge to designate some links as primary and others as backups. The unit also supports a load-balancing feature that evenly distributes traffic across the primary links.

The NPS/2725-200 can detect when net devices have been moved or added, and automatically updates the routing tables.

The bridge complements the NPS/2725-100, which was announced last March. That product acts as an X.25 packet assembler/disassembler that feeds X.25 packets to either an X.25 network or an NPS/2745 Resource Processor. The NPS/2725-100 can also forward IBM Systems Network Architecture/Synchronous Data Link Control packets to an IBM front-end processor or an NPS/2745 Resource Processor.

Because the NPS/2700 products share a common architecture, each device can be controlled via a single NPS/2705-100 or NPS/2705-200 Network Management System.

The NPS/2705-200 uses a multitasking workstation to control large NPS/2700-based networks. The NPS/2705-100 uses a DOS-based microcomputer to manage smaller NPS/2700 networks.

Both net management systems enable users to view current network status, current configuration information, usage statistics and alarms as they occur. As many as 250 NPS/2725-200s can be controlled by a single NPS/2705-200.

Apart from the rest

According to Larry Fillmer, vice-president of marketing for Amdahl, the common architecture of the NPS/2700 family sets the NPS/2700 apart from Amdahl's existing line of packet-switching products and T-1 multiplexers. Those products, for example, do not have an integrated network management system, he said.

The NPS/2725-200 and other NPS/2700 products are scheduled to be available early next year. NPS/2725-200 pricing starts at $10,000 for a unit supporting one Ethernet adapter board. ◼

Evolution brings greater spending

continued from page 17

Despite the heavy investment in data communications, banks still spend more money on PBXs than any other type of networking equipment. Many banks are installing small PBXs in their branch operations to replace Centrex services.

Security is main concern

However, PBXs do not play a large role in data networking. "Banks don't use the combined data and voice capability of PBXs as often as many other organizations," Huntley said. One of the prime reasons for this is the need to keep financial transactions secure.

Huntley explained that a growing number of banks are installing voice response units. These systems sit between PBXs and host systems, and enable callers to access account information on the host by entering commands from a telephone keypad.

The study also concluded that T-1 networking will remain attractive as banks continue trying to control voice and data communications costs. ◼

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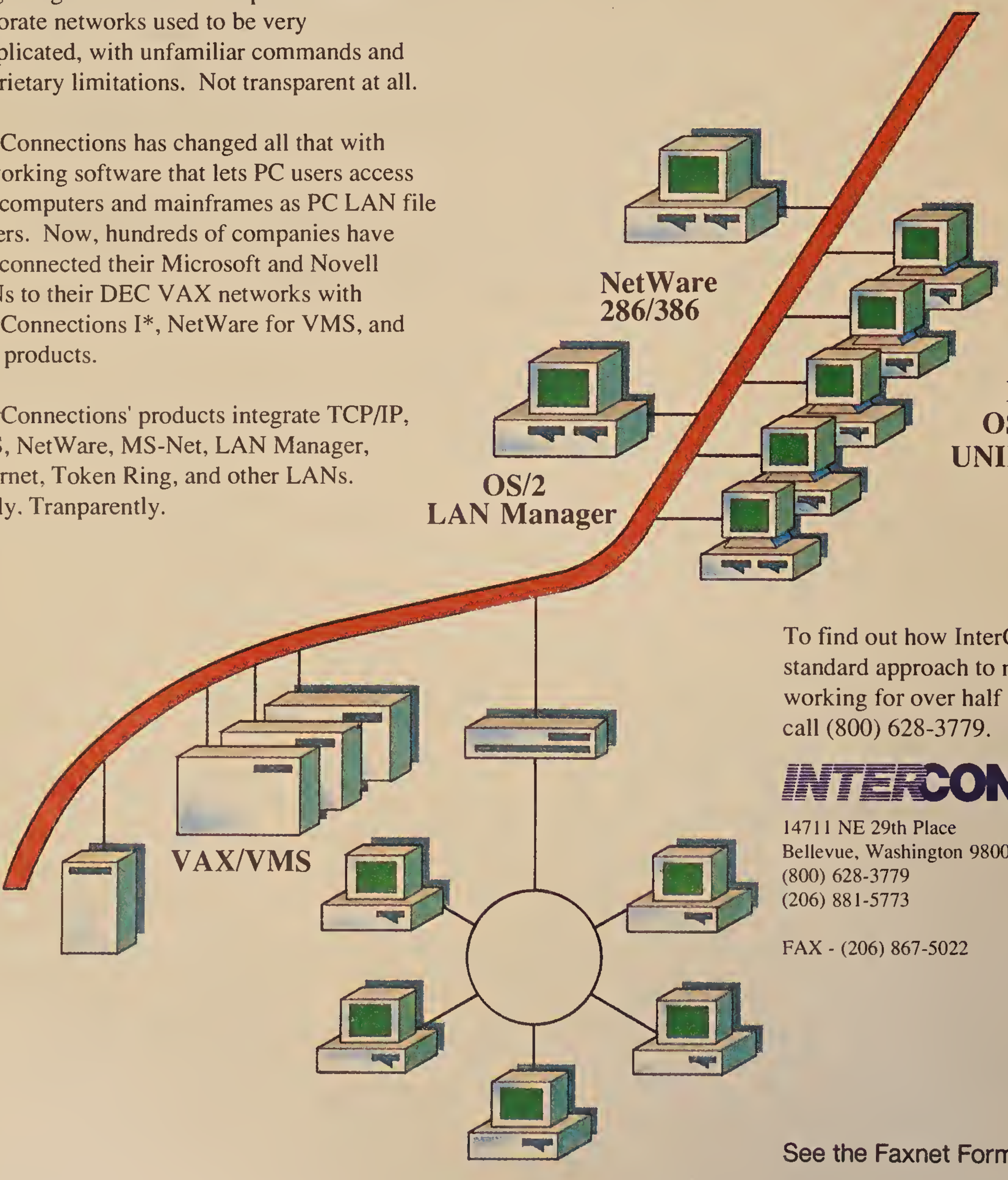

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See the Faxnet Form on Page #47

T-1 buyers probe beyond base features

continued from page 17

cated management capability so we don't have to continually add people to maintain the network," said Bob Bystedt, Rockwell's director of telecommunications.

With the NET equipment, Rockwell will be able to collect alarms from and perform diagnostics on remote equipment from a central site, which is not possible with the products the company uses now (see "NET wins bid to supply Rockwell with T-1 muxes," page 17).

But had Rockwell chosen its T-1 equipment on the merits of network management alone, the winner would have been DCA, Bystedt said. Other factors — including company stability, service and support — tilted the scale in NET's favor.

We try harder

Support also figures prominently in vendor evaluation.

When it went searching for a T-1 vendor to upgrade its statewide network, the state of Maryland told vendors it would have to be able to respond to major outages within two hours, said Norm Martin, director of the office of telecommunications management within Maryland's Department of General Services.

The state accepted a joint bid from Newbridge Networks, Inc. and Chesapeake & Potomac Telephone Co. of Maryland, under which the Bell operating company agreed to meet the state's service and support demands, Martin said.

Among the other reasons Martin cited for the decision to go with Newbridge was his perception that the company was on the leading edge technologically and would continue to improve its products.

"In some ways, you look at it as the No. 2 trying to be No. 1 syndrome," he said. "Some smaller companies have to remain on top in order to remain competitive."

McDonnell Douglas Corp. in St. Louis recently selected NET for a T-1 net upgrade because it thought NET could stay abreast of market developments, according to Robert Heinze, manager of transmission systems.

"It's more than stability; it's how aggressive they are to update their product in the future," Heinze said.

Stability is a factor, however, and he said NET's marketing agreement with IBM helped NET in more ways than one.

Besides the financial stability the relationship gives NET, McDonnell Douglas is an IBM shop, and Heinze said the relationship might lead to integrated products. Network Strategies' Held said such alliances are also a good indication that the vendor will be around for a long time, which is an important consideration.

When the customary research turns up a draw, users typically resort to other measures. Maryland's Martin required each vendor to supply him with names of customer references.

Another user took a more extreme measure. "It came down to two vendors that we felt met all the criteria we had [asked for]," said Michael Ozawa, a consultant in the technology planning department of American President Systems, Ltd. of Oakland, Calif.

"The only way we felt we could get an accurate judgment of their support capabilities was to do a bake-off — bring the equipment on site and look at their implementation procedures and their overall project management procedures."

Ozawa said his company tested two vendors' products for three months before selecting DCA equipment for an eight-node T-1 net. He declined to name the runner-up. ◪

NET wins bid to supply Rockwell

continued from page 17

The decision to use NET products was reached after evaluating bids from 12 vendors that responded to a request for proposal issued in August 1988, Bystedt said. The field was eventually narrowed to four: NET, Digital Communications Associates, Inc., Amdahl and a joint bid from Codex Corp. and StrataCom, Inc.

A Rockwell evaluation team chose NET because its multiplexers offered the best voice, data and net management functionality, though they were not rated highest in each of those categories, Bystedt said.

All four vendors were competitive on pricing, with only an 8% margin between the highest and lowest proposals. "That indicates to me it's a pretty competitive marketplace," Bystedt said.

Despite the high technical rating and the quality of service Rockwell has received from Amdahl, Rockwell decided to break off that relationship because the Network Processor Series/2745 Resource Processor T-1 multiplexers Amdahl proposed are not available and would have delayed the company's migration.

Codex and StrataCom's Model 6290 was strong in the voice area, but the technical evaluation team was concerned about the multiplexer's ability to handle high-speed SNA file transfers, which the company currently supports at 512K bit/sec and will soon process at T-1 speeds.

DCA's System 9000 T-1 multiplexers, by contrast, were strong in the data and net management areas, but the voice compression capabilities were a cause of concern because they required external devices.

Another factor in NET's favor was that it provided an opportunity to manage the net T-1 equipment under a single network management system. NET's system, based on a Sun Microsystems, Inc. workstation, can monitor alarms generated by the net multiplexers and perform diagnostics to isolate problems.

NET's system will enable Rockwell to streamline its "archaic, people-intensive" method of managing the company's T-1 network, Bystedt said. ◪

How Telebit modems made some fast friends in the LAN industry.

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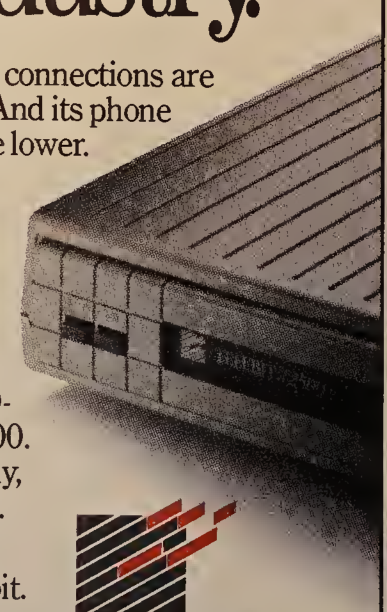

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LOCAL NETWORKING

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Worth Noting

"By 1993, close to 90% of all Fiber Distributed Data Interface shipments will be used to connect high-speed engineering workstations directly to host computers. I don't see FDDI emerging as a PC LAN connectivity option for the average PC user."

Brad Baldwin
Local network
industry analyst
Dataquest, Inc.
San Jose, Calif.

Netnotes

LAN Systems, Inc. this fall plans to release two new utilities for local nets running Novell, Inc.'s NetWare.

LANSight lets network administrators use their own workstations to access the screen and keyboard of any node on the net. Once two workstations are linked via LANSight, any keyboard activity and display response on one is mirrored on the other.

LANSight, which requires only 5K bytes of memory, can be used to run diagnostic programs that help the administrator determine the condition of a remote personal computer. The product will be available in November for $395 per server.

LANSelect is a terminate-and-stay-resident menu program that lets users load a variety of network utilities from within a software application.

LANSelect, which includes LAN Systems' LANPrint program, uses 5K bytes of workstation memory. It costs $495 per server and will be available by the end of this month.

For more information, contact LAN Systems at 300 Park Ave. South, New York, N.Y. 10010; (212) 995-7700.

Interpreter, Inc. last week said it is enhancing its Facsimile Server for local networks to enable it to route in-

(continued on page 25)

Apple's portable product spurs rush of net options

Suppliers unveil Portable Macintosh net tools.

By Sarah Vandershaf
West Coast Correspondent

Apple Computer, Inc.'s recent introduction of the Portable Macintosh has third-party suppliers rushing network options to market for the 15-pound microcomputer.

In the weeks since Apple's Sept. 20 introduction of the $5,799 portable version, Adaptec, Inc. and Farallon Computing, Inc. have announced communications products that complement the machine's existing network features.

The Portable Macintosh comes with a small computer system interface (SCSI) port, an AppleTalk port and a port for an external modem. It is also available with an internal modem and a phone jack.

Adaptec, based in Milpitas, Calif., introduced an external Ethernet interface — called the Nodem LAN — to connect Portable Macintosh systems to Ethernets. The interface leaves the one internal expansion slot in the portable free for other uses, Adaptec said.

The device can be toted with the portable or used as a network docking unit for multiple portables. The Nodem connects the Portable Macintosh to thick- or thin-wire Ethernet cable, or twisted-pair wire via the portable's SCSI port.

The Nodem has been tested successfully with 3Com Corp.'s 3+, Novell, Inc.'s NetWare and The TOPS Division of Sun Microsystems, Inc.'s TOPS local networks. It costs $545 for thick-wire Ethernet, $595 for thin-wire Ethernet and a version for twisted-pair wire costs $645. It is available now.

Farallon, of Berkeley, Calif., announced The Farallon Portable Pack, a traveling kit that contains software and wiring accessories that enable the portable to be linked to a modular phone jack and transmit files to remote networks.

The package, designed for use with a Portable Macintosh outfitted with a $449 internal 2,400

(continued on page 58)

Norwegians say Ethernet security lax for hospitals

IDG International News Service

OSLO, Norway — Norway's civil liberty laws, among of the world's strictest, are encouraging Norwegian hospitals to shy away from Ethernet local networks.

Norwegian law stipulates that patient information can only be accessed by a limited number of health personnel, and some computer executives say Ethernet lacks the security needed to keep outsiders out of patient files.

> Some Norwegian network managers are beginning to look to MAP as an alternative.
>
> ▲▲▲

Verner Andreassen, information systems manager at Haukeland, Norway's second largest health institution, strongly advises organizations not to consider Ethernet for use at hospitals.

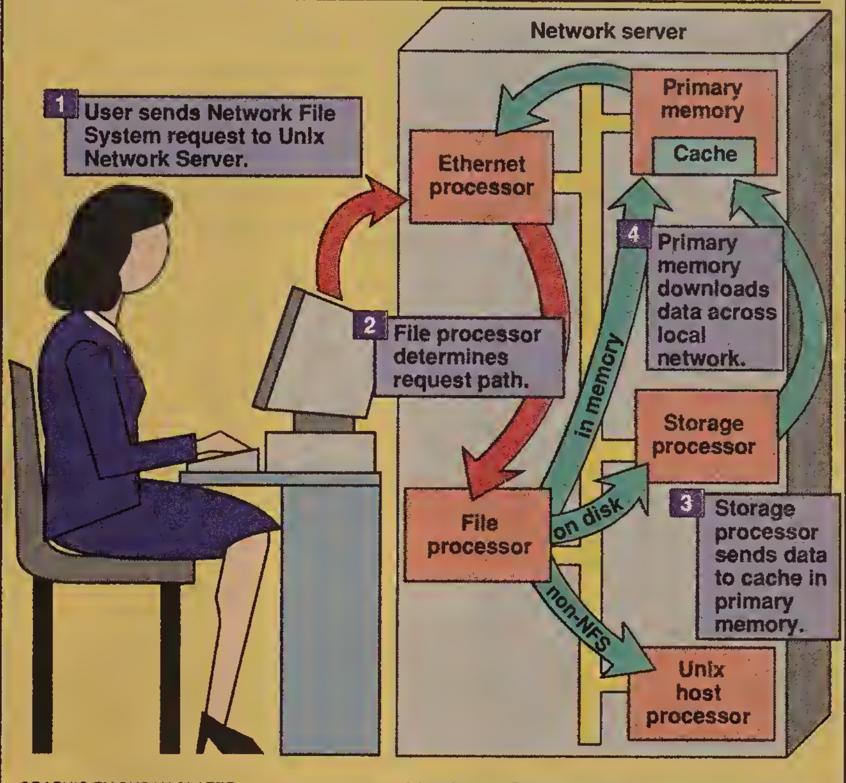
"Transmission of patient-related information over Ethernet will violate existing laws on the protection of the individual," Andreassen said. "All information transmitted on Ethernet, based on the IEEE 802.3 protocol, can be accessed by anyone on the network. This protocol doesn't have any access control mechanisms to deny unauthorized access to information."

Some Norwegian network managers are beginning to look to Manufacturing Automation Protocol, the factory local network technology developed by General Motors Corp., as a viable alternative for secure local nets.

MAP uses an IEEE 802.4 token-bus network and denies unauthorized personnel access to specific information. In a multipurpose network based on IEEE 802.4 networks, an accountant, for example, would only have access to financial information.

The Norwegian Data Commission, the public watchdog agency monitoring data base abuse of personal information, is aware of problems that may arise by using Ethernet at hospitals. But special adviser Johannes Hansen said the commission is not considering placing a total ban on the technology. ◘

Auspex's Unix Network Server architecture


Network server
1 User sends Network File System request to Unix Network Server.
Ethernet processor
Primary memory
Cache
2 File processor determines request path.
4 Primary memory downloads data across local network.
in memory
Storage processor
on disk
3 Storage processor sends data to cache in primary memory.
File processor
non-NFS
Unix host processor

GRAPHIC BY SUSAN SLATER

SOURCE: AUSPEX SYSTEMS, INC., SANTA CLARA, CALIF.

Auspex superserver ups I/O processing

NS 5000 uses special bus design, processors to off-load NFS requests from server memory.

By Susan Breidenbach
West Coast Bureau Chief

SANTA CLARA, Calif. — Start-up Auspex Systems, Inc. today is scheduled to introduce a Unix-based superserver that represents an emerging class of servers designed to provide network workstations with file, print and other services.

Auspex's NS 5000, its first product, has a streamlined bus architecture that is capable of handling network I/O faster than 80386-based workstations retrofitted as servers.

Current servers, Auspex said, do not have the bus architecture necessary to handle peak I/O loads, creating a bottleneck between the processor and the network.

The NS 5000 addresses the I/O bottleneck with a unique multiprocessor architecture that off-loads network, file system and disk access functions from the server's CPU to three dedicated processors on an enhanced VMEbus.

The product is designed to support Unix workstations linked by Ethernets. It supports up to eight Ethernet segments and can be configured with more than 16G bytes of disk storage.

Auspex also took the Network File System (NFS) running under Unix [Sun Microsystems, Inc.'s SunOS] and ported it to a separate processor with its own specialized operating system. By separating NFS from Unix, Auspex said the server can process I/O faster.

"The Unix operating system has never been particularly efficient at handling I/O," said Dick Bush, vice-president of marketing for Auspex.

In a typical engineering design environment today, an Ethernet segment with its own server can only support five to 10 devices because of the amount of traffic, according to Bush.

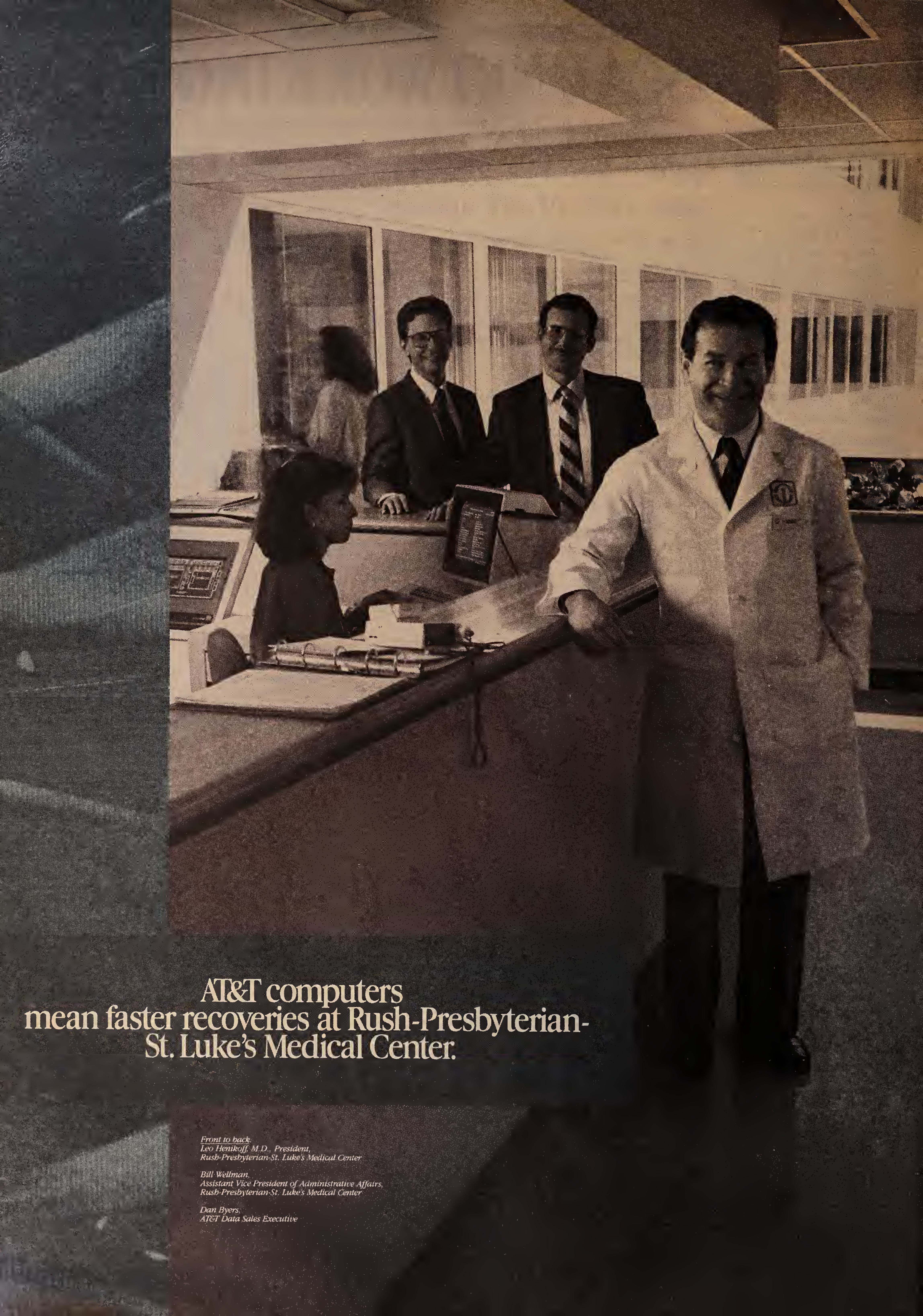
> "Unix has never been particularly efficient at handling I/O," Auspex's Bush said.
>
> ▲▲▲

Especially taxing are diskless workstations, which have no local storage and depend on the network for booting and downloading applications, libraries and files across the network.

Much of the data has to be replicated in each of the servers on the various Ethernet segments, creating backup and recovery nightmares for network administrators.

"File revisions on all the different servers tend to get out of synch," said Bush. "We've taken all the multiple redundant files, libraries and such, and put them

(continued on page 25)


AT&T computers mean faster recoveries at Rush-Presbyterian-St. Luke's Medical Center.

Front to back:
Leo Henikoff, M.D., President,
Rush-Presbyterian-St. Luke's Medical Center

Bill Wellman,
Assistant Vice President of Administrative Affairs,
Rush-Presbyterian-St. Luke's Medical Center

Dan Byers,
AT&T Data Sales Executive

Chicago, Illinois
May 4, 1989

Rush didn't want to just survive cost-cutting in the healthcare industry. They wanted to flourish. So to help them compete better, and treat their patients better, AT&T prescribed a distributed networked computing solution. Rush's Leo Henikoff, M.D., Bill Wellman, and AT&T's Dan Byers review the hospital's new Patient Care Information Network.

Rush: You know, it's been a tough time for hospitals. But even though 10 in Chicago have closed, we're doing well. Especially with the new system.

AT&T: Now that your information barriers are gone.

Rush: That's right. Before, no one was really linked up. Our doctors couldn't access clinical data and pharmacology on the same terminal. To make matters worse, some departments were actually duplicating data entry.

AT&T: But now many of your departments are networked. And not just those throughout your campus—but all over the Chicago area.

Rush: It's easier too, since it's one system now. Our AT&T 3B2 Computers make great file servers to our mainframes. And with your 6386 WGS desktops at the nursing stations, data is right at the end of a light pen. In fact, our residents say they're saving hours in run-around time.

AT&T: Don't forget about the AT&T StarLAN and StarGROUP network that link your Compaq and IBM PCs with the AT&T WGS computers.

Rush: Sure. Plus the AT&T ISN is the heart of our network. It links an IBM 3083 for accounting, a VAXcluster for lab tests, a Tandem host for pharmacy records, and AT&T 3B2's. And because we move around so much, the ISN and AT&T SYSTIMAX PDS let us plug displays or PCs into any jack.

AT&T: So, do you think another solution would have had the same value?

Rush: Not really. There are viable alternatives out there. But AT&T is the most cost effective. Other vendors aren't really one-stop-shops either. You helped us integrate a very complex group of systems, trained us, plus you're always there for us. Now *and* when we expand.

AT&T: What about your clinical staff? Have they noticed the change?

Rush: Without a doubt. Our doctors and nurses can now spend much more time with patients since they have faster access to information. Bottom line, we feel good about going with AT&T.

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THE CHALLENGE:

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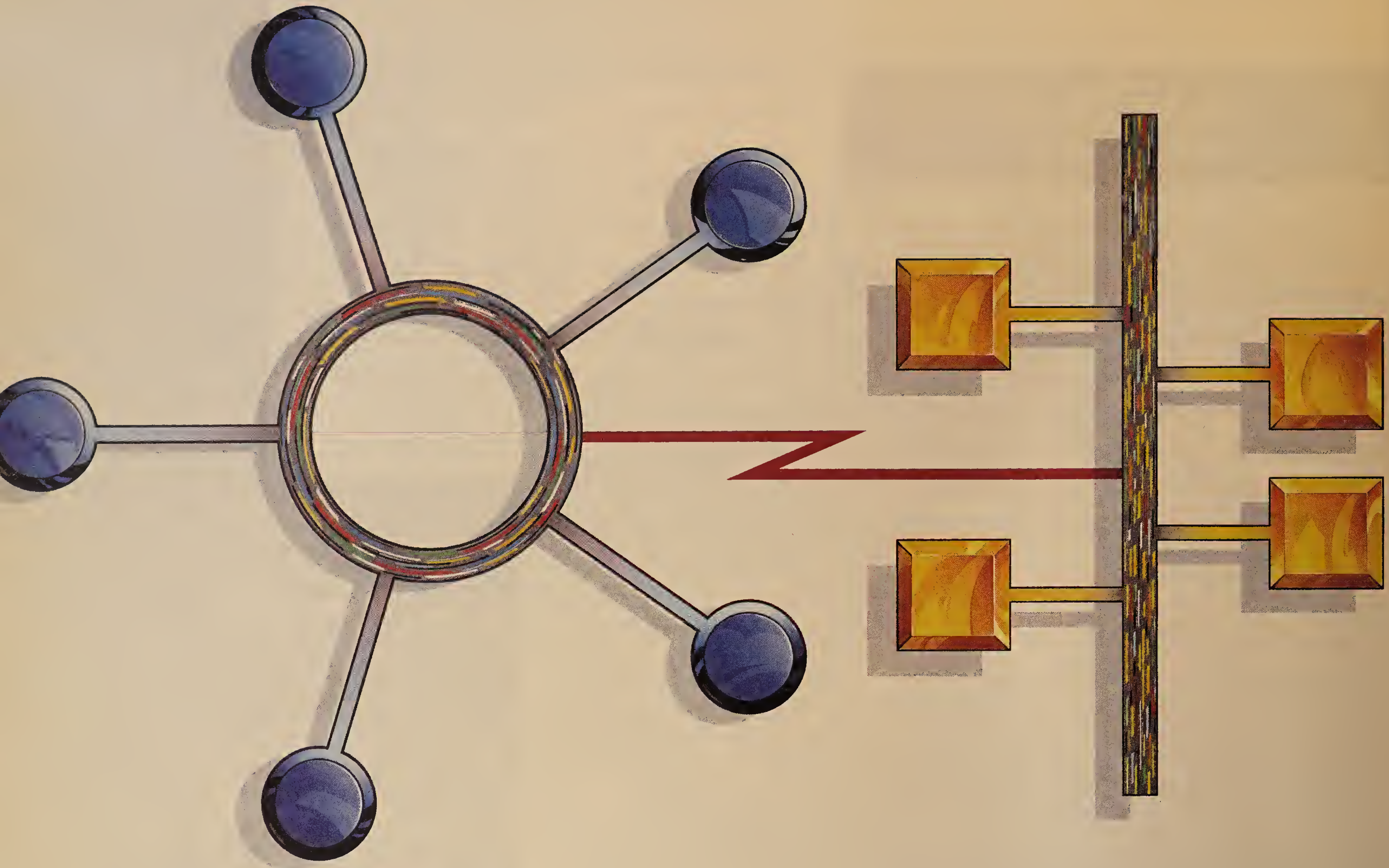

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See Us At INTEROP Booth #706.

See the Faxnet Form on Page #47

Auspex superserver ups I/O processing

continued from page 21

in one location — a superserver."

The NS 5000's Ethernet subsystem accommodates up to four Ethernet processors, each of which can support two parallel Ethernet segments. The processors handle all protocol processing from the Internet Protocol (IP) level to the NFS level and also handle full-speed IP routing among the separate segments.

The processor at the heart of the NS 5000's storage subsystem operates 10 5M byte/sec parallel, synchronous Small Computer System Interface (SCSI) I/O channels simultaneously. Use of high-speed SCSIs provides several routes that a data request may take, instead of having to vie for the same channel with other data requests.

Disk storage is organized in racks of 760M-byte, 5.25-in. hard disk drives. Two racks constitute an array, and each of an array's 10 disks can read and write in parallel.

This enables the server to dedicate an array for each Ethernet subnetwork so the different subnets don't compete with one another to write data to the same storage subsystem, as is the case in conventional servers.

Caching in

The main system board running the SunOS has 8M bytes of memory and a separate board with up to 96M bytes of memory that serves as a cache for the NFS subsystem. The cache holds the most frequently accessed data requested by users on the network enabling it to service user requests without having to search the storage subsystems.

A built-in algorithm enables the cache to rotate data in and out, depending on the number of times data is requested. When new data is added to the cache, for instance, the least frequently requested data is written to disk to make room.

Server requests from client workstations come through one of the NS 5000's Ethernet ports to the network processor, which determines whether it is an NFS request or not. If not, the request goes to the server's CPU.

If it is an NFS request, the server's file processor is notified and it determines whether the requested data is in the cache memory or not. If it is, data is retrieved from the cache and shipped to the client.

If the data is only on disk, the disk subsystem is instructed to retrieve it. The data is then sent to the requesting client and to the cache.

Bush said this NFS subsystem, along with parallel pipes between the various server components, enables users to add up to eight Ethernet subnets with 10 workstations to each NS 5000 without significantly degrading network performance.

According to Auspex, Unix file servers spend about 85% of their time handling NFS traffic; the NS 5000's NFS processor can handle 1,000 8K-byte NFS operations per second.

When configured with eight Ethernet segments, this results in a network I/O capacity of 80M bit/sec, or about 10 times that of a conventional Unix server.

The NS 5000 is currently being beta-tested and is scheduled for commercial release in January 1990.

Pricing ranges from $114,900 for a base model with two Ethernet ports, 2.6G bytes of disk memory and 16M bytes of cache memory, to $200,000 for a version with eight Ethernet ports, 16G bytes of disk capacity and 96M bytes of cache memory. ◘

Netnotes

continued from page 21

coming faxes to specific users. This eliminates the need for a network administrator to monitor incoming traffic and distribute individual faxes to their addressees.

The new routing capability, scheduled for November availability, interfaces to the direct inward dialing (DID) services available through local telephone companies. Each network user is assigned a personal fax number, and the various DID extensions are mapped to user logon names.

The sender dials a user's personal fax number, and the fax goes through the Facsimile Server to the user's private directory on the net file server. The user then gets a message that a fax has been received.

Pricing for the Facsimile Server starts at $5,600 when bundled with a dedicated personal computer and $3,900 for the software and fax board alone. The price of the routing option has not been set.

For more information, contact Interpreter, 11455 W. 48th Ave., Wheat Ridge, Colo. 80033; (303) 431-8991. ◘

To get information on products or services advertised in this week's issue of *Network World*, see the FAXNeT Form on Page #79

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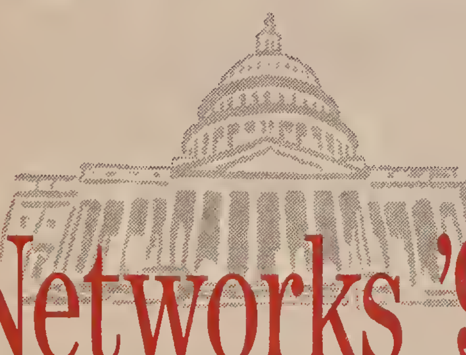

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2. Free accommodations and conference admission. Second Prize winner will receive three nights accommodations at the Grand Hyatt, plus one in-depth tutorial and free admission to the full conference and exposition. Approximate total value: $1,375.
3. Free conference admission. Third prize, valued at $895, includes your choice of one day-long, in-depth tutorial and full conference and exposition admission.

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Whether you win a prize or not, you win. You will get information on a conference and exposition that can give you the expertise you need to stay ahead of your competitors. Send in the form today, or FAX it to 508-872-8237.

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Entry Form must be filled out with *all* information requested and received at the address shown NO LATER THAN November 30th, 1989. One entry per person; one prize per person. No registration is required to enter, but if you win after you have registered, you will receive a full refund. Winners will be chosen at random and announced on December 15th, 1989. Decision of the judges is final. All residents of the continental U.S. and Canada 18 years or older are eligible, except employees of International Data Group, its agencies, affiliates or subsidiaries. Winners must consent to the use of their names and photographs in contest publicity.

For a copy of the complete contest rules, or a list of winners, send a self-addressed stamped envelope to Communication Networks '90, P.O. Box 9171, Framingham, MA 01701.

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Worth Noting

"With all their resources, IBM still hasn't been able to come up with a good [NetView] graphics package of its own. That's really the mind-boggling thing."

Atul Kapoor
Vice-president
Kaptronix, Inc.
Haworth, N.J.

Dialogue

Do you believe the job of network manager has become more difficult and stressful since divestiture?

"Absolutely. Running a private network is difficult and an unnecessary burden. Our net is large enough to qualify as the ninth largest phone company in the U.S. As of Jan. 1, 1990, MCI will take over responsibility for running our network. We can't wait for that date to arrive."

Jim Fitzgibbon
Technology liaison for
client services
Merrill Lynch & Co., Inc.
New York

"Yes, things have gotten more stressful [since divestiture], but at the same time, the job has gotten more rewarding.

"Divestiture opened the door to more competition, which has lowered prices and brought more services and products to the table. The result has been that you have to manage your network more, and this can be stressful."

Clint Childs
Consulting analyst,
telecommunications
Crowley Maritime Corp.
San Francisco

"Divestiture has made the network manager's job more interesting, challenging and fun. Network managers now have more selection in equipment and services; they have freedom of choice they never had before divestiture."

Glenn Votaw
Telecommunications
administrator
Boeing Commercial
Airplanes Division
Renton, Wash.

MANAGEMENT PROFILE

▲▲▲

BY BARTON CROCKETT

United Technologies' holdings include Pratt & Whitney, a manufacturer of jet engines.

United Technologies exec aims for net consolidation

Firm's Otis Elevator test tower.

HARTFORD, Conn. — When Robert Forte took over as director of telecommunications at United Technologies Corp. five months ago, he landed one of the biggest challenges of his career.

Forte, the former director of information systems at Burger King Corp., is charged with bringing order to the data networking disorder of his new employer, a $15 billion diversified manufacturer based here.

For years, United Technologies has effectively met its voice needs by using a T-1 and T-3 backbone to pool traffic from 19 divisions, which have offices in nearly 30 cities nationwide.

(continued on page 30)

BOOK REVIEW

BY LEE FOOTE

New book outlines EDI's legal ramifications

EDI and American Law: A Practical Guide, Benjamin Wright, J.D. (Alexandria, Va.: TDCC: The Electronic Data Interchange Association, 1989), $69.95.

Benjamin Wright's book, *EDI and American Law: A Practical Guide,* should be read by all managers and professionals responsible for electronic data interchange and the attorneys counseling them.

In addition to the basic EDI legal considerations, it provides guidance in negotiating agreements with third-party EDI service providers, avoiding antitrust implications of sharing competitive information, record keeping requirements of local, state and federal governments, and information about internal accounting controls.

In this day and age of overregulation, it may seem surprising that EDI lacks judicial precedent and a legislative foundation.

(continued on page 28)

Foote is manager of EDI at E.I. du Pont de Nemours & Co., Inc. in Wilmington, Del.

Auto industry use of EDI evolving as needs change

EDI bolsters JIT as makers move to standards.

By Wayne Eckerson
Staff Writer

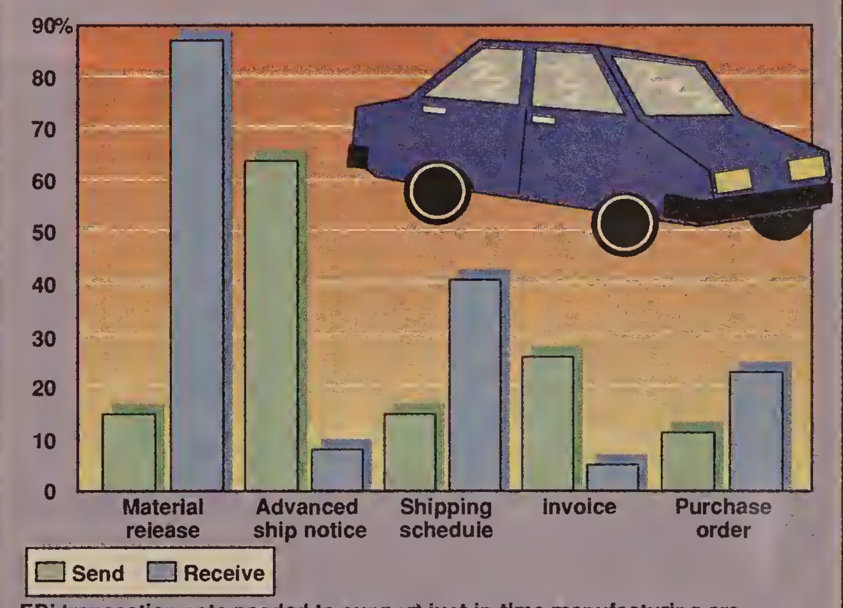
DETROIT — According to a survey released here last week, the use of EDI in the automotive industry is evolving to support just-in-time manufacturing, industry standards and second-tier suppliers.

The results of the survey, which was conducted by the Automotive Industry Action Group (AIAG) across its base of 800 corporate members, were presented at the Auto-Tech '89 conference.

Thirteen percent of companies surveyed had more than $3 billion in sales, and 62% had over $20 million in sales. The majority of the respondents said they implemented electronic data interchange in response to a customer request or to improve trading relationships (see graphic, page 28).

One of the findings of the survey was that EDI is commonly used by automakers to support just-in-time manufacturing. "Just-in-time and EDI go hand in hand," said Tony Zerafa, managing director of AIAG in Southfield, Mich. "You can't have one without the other."

Commonly used EDI transaction sets



EDI transaction sets needed to support just-in-time manufacturing are the most heavily used in the auto industry.

GRAPHIC BY SUSAN SLATER SOURCE: AUTOMOTIVE INDUSTRY ACTION GROUP, SOUTHFIELD, MICH.

With just-in-time manufacturing, suppliers coordinate shipments with a manufacturer to deliver raw materials or parts as close to the manufacturing date as possible. This reduces inventory overhead and associated costs for the manufacturer.

Almost 90% of the companies surveyed said they receive material release documents from automakers via EDI.

Manufacturers use material releases to let suppliers know what goods they will be needing so the supplier can assemble the order (see graphic below).

The next most heavily used EDI transaction sets in the industry also relate to just-in-time manufacturing. Sixty-four percent of the suppliers surveyed said they send advanced shipping notices via EDI, and 41% said they receive shipping schedules via EDI.

Advanced shipping notices are used by suppliers to describe the contents of a shipment and the scheduled time of delivery. The notices also serve as a supplier's invoice. Automakers transmit shipping schedules to suppliers to let them know when and where to ship goods.

The survey also showed there has been a sharp rise in the number of companies converting from proprietary EDI formats to ANSI standards.

Almost all automotive firms surveyed said they plan to use one or more ANSI formats by 1990. That's a sharp rise from 1985, when just 31% of the same companies used ANSI transaction sets. Last year, 81% of the firms surveyed said they used ANSI standards.

While survey respondents said there was a continuing need for proprietary formats, the number of companies transmitting proprietary material releases is expected to decline from 60% in 1988 to 34% after 1990; companies sending proprietary advanced shipping notices should decline from 56% to 30%.

"Many companies that implemented proprietary EDI systems a long time ago are upgrading those systems to handle standard formats," Zerafa said.

The survey also showed that

(continued on page 28)

Book outlines EDI's legal ramifications

continued from page 27

Many companies are constraining their EDI expansion or not undertaking EDI at all in fear that the uncharted legal waters are too shallow to navigate.

Today's legal presumption is that documents are in written form and signed by an authorized representative. How does one deal in a world of "unsigned" electronic documents? While EDI waters may be filled with shoals, Wright's guide helps us plot a prudent course.

One of the most important issues Wright covers is the "written requirement." Wright is an independent attorney practicing in the corporate, contract and electronic communications law fields.

If you think back to the early days of commerce, there were several reasons for insisting on written documents: to obtain proof of transaction, to get evidence of delivery, to bind the transaction and to ensure proper authorization to conduct the transaction.

> Creating paper copies of EDI messages would seem to defeat the goals of eliminating paper.
>
> ▲▲▲

EDI practitioners are struggling with questions of how you "sign" an electronic transmission. This is accomplished using a prearranged code and then authenticating electronic signatures. The questions focus on security issues involving procedures such as passwords, acknowledgments and encryption of data transfers.

Another issue Wright tackles is how to satisfy requirements for keeping paper evidence of transactions that can be used by internal and external auditors, tax authorities and the courts. Creating paper copies of EDI messages would seem to defeat the goals of eliminating paper. This area is covered thoroughly and leaves one with sound, practical recommendations.

Another EDI issue Wright examines is legal agreements covering EDI arrangements with trading partners. Companies have found it extremely frustrating and burdensome to negotiate unique agreements with each company that requests an EDI relationship.

He looks into whether these agreements are necessary (he says yes), and if so, what they should contain.

While the topic was well covered and provides important guidance, I was disappointed to see little mention of the recent work of the American Bar Association and ANSI ASC X12 committees. They have drafted a pro forma partner agreement covering EDI considerations that should be confirmed in writing by EDI partners.

Communications managers will be particularly interested in the network agreement chapter because it gives extensive advice about negotiating fair and complete contracts with EDI network service providers.

Although well worth reading, the book is a little schizophrenic. Generally, it is aimed at EDI managers and professionals, but occasionally it lapses into the traditional attorney's vein of citing case law and legislation more often than is necessary to make the point.

It is easily read, however, and not a legal tome to be thrown overboard as an anchor. ◼

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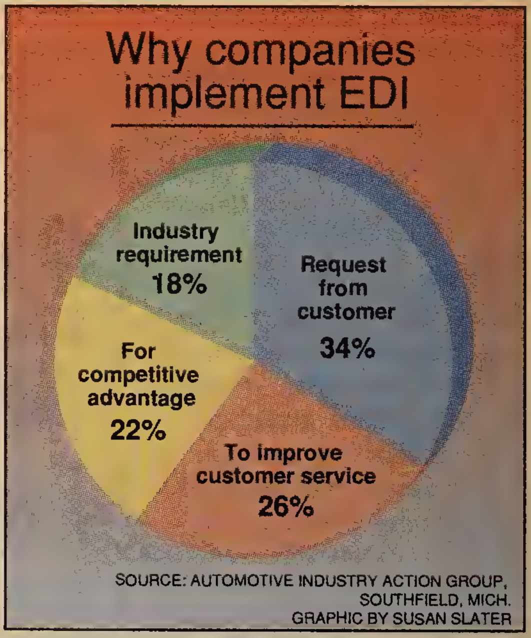
Auto industry use of EDI evolving

continued from page 27



SOURCE: AUTOMOTIVE INDUSTRY ACTION GROUP, SOUTHFIELD, MICH.
GRAPHIC BY SUSAN SLATER

many auto suppliers plan to establish EDI links with their own suppliers, spreading the use of EDI to a second tier within the automotive industry.

According to the survey, the number of companies receiving material releases will remain constant in the 1990s, but the number of companies sending these messages will increase by 270%. These figures suggest that first-tier auto suppliers will be sending material releases to their suppliers, which will probably be first-time EDI users.

Similarly, the number of companies sending advance shipping notices should not change significantly, but the number of companies receiving those messages should increase 230%.

"A critical mass of automakers and first- and second-tier suppliers will begin using EDI standards in the next two years," Zerafa said. ◼

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*Independent test results available on request. © 1989 NEC America, Inc.

Exec aims for net consolidation

continued from page 27

Management of data networks, however, has been more laissez-faire. Control is distributed to each division, and a hodgepodge of networks have sprung up.

Forte is charged with rectifying this situation. "We believe there are tremendous opportunities for savings through [data] network consolidation," he said.

Forte has been pursuing his objective at a breakneck pace. Barely two months into his new job, he issued a request for proposal seeking a single carrier to supply all of United Technologies' transmission services. The firm's biggest supplier today is AT&T, but United Technologies also buys services from an array of other carriers.

The goal of the RFP is to have a carrier come up with a network design that integrates nearly all of the company's voice and data services on a single cost-effective backbone. In pursuing that goal, United Technologies is giving carriers a great deal of design leeway. "We know our service level requirements, and we want to give the carriers as much flexibility as possible to come up with network architectures that meet our needs," Forte said.

United Technologies is also asking carriers to bid on taking over day-to-day net maintenance and operation. In addition, the company wants carriers to bid on building a new net management system that would integrate the multiple net management systems operated by the firm's various divisions. The divisions include several advanced network users, such as jet engine maker Pratt & Whitney and Otis Elevator Co. (see "Firm's tests show ISDN to improve video," this page).

Final bids on the RFP are due this week. All, part or none of the RFP may be awarded. Any contract arising from the RFP could rival the $200 million, five-year contracts Merrill Lynch & Co., Inc. awarded to MCI Communications Corp. earlier this year for similar services.

According to Forte, awarding this kind of contract could not only save United Technologies money, it could also help the company improve network service.

By consolidating the company's data networks on a single backbone, the company could afford to buy better data communications equipment, Forte said. In addition, the economies of bulk transmision capacity are such that you typically get more bandwidth than you need, ensuring that the company could accommodate future data traffic growth.

Centralizing control of data nets at corporate headquarters will require Forte to move some data communications specialists out of divisional communications departments. Since many of these specialists are involved in leading-edge net applications, centralizing them will let the whole company benefit from their expertise.

According to Forte, the challenge of developing the new network architecture is one of the biggest he has faced in his professional career. "At Burger King, I was involved in a broader array of services, including both computing and communications," he said. "But this is a much larger company, and there's a great opportunity here for me to make a difference." ◼

Firm's tests show ISDN to improve video

EAST HARTFORD, Conn. — Airplane engine maker Pratt & Whitney recently concluded tests that show use of ISDN improves the picture quality of videoconferences and makes it easier to move video gear from office to office.

The firm, a division of United Technologies Corp., used Integrated Services Digital Network Basic Rate Interface lines to link two videoconferencing units rented from PictureTel Corp.

Employees said the 64K bit/sec capacity of the ISDN B channels provided a higher quality image than standard 56K bit/sec connections.

Karl Kuhn, manager of network services, said ISDN made it possible to plug in videoconferencing gear anywhere in the building, providing a new level of mobility. "Basically, we could just hook up an ISDN terminal adapter, issue some commands to the switch and begin running the experiment," he said.

The video units communicated through Pratt & Whitney's AT&T 5ESS switch, which supports voice service for four major Pratt & Whitney facilities in Connecticut. The alternative to ISDN — dedicated circuits or switched 56K bit/sec links — usually requires offices to be rewired to accommodate two 56K bit/sec circuits.

In the experiment, Kuhn rolled the PictureTel equipment around Pratt & Whitney's main office here and randomly plugged them into phone jacks in various conference rooms.

Video communications were tested using both one and two 64K bit/sec ISDN B channels.

One of the prime reasons for testing ISDN videoconferencing was to examine low-rate video, in which video signals are compressed for use on circuits supporting speeds ranging from 56K to 112K bit/sec. "We feel that low-rate video is the real ISDN application," Kuhn said. "Everything else [that users have discussed using ISDN for] could be done just as well by other means."

Kuhn said the extra mobility provided by ISDN makes it easier to "achieve the often stated goal of bringing video capabilities to the desktop." ◼

— Barton Crockett

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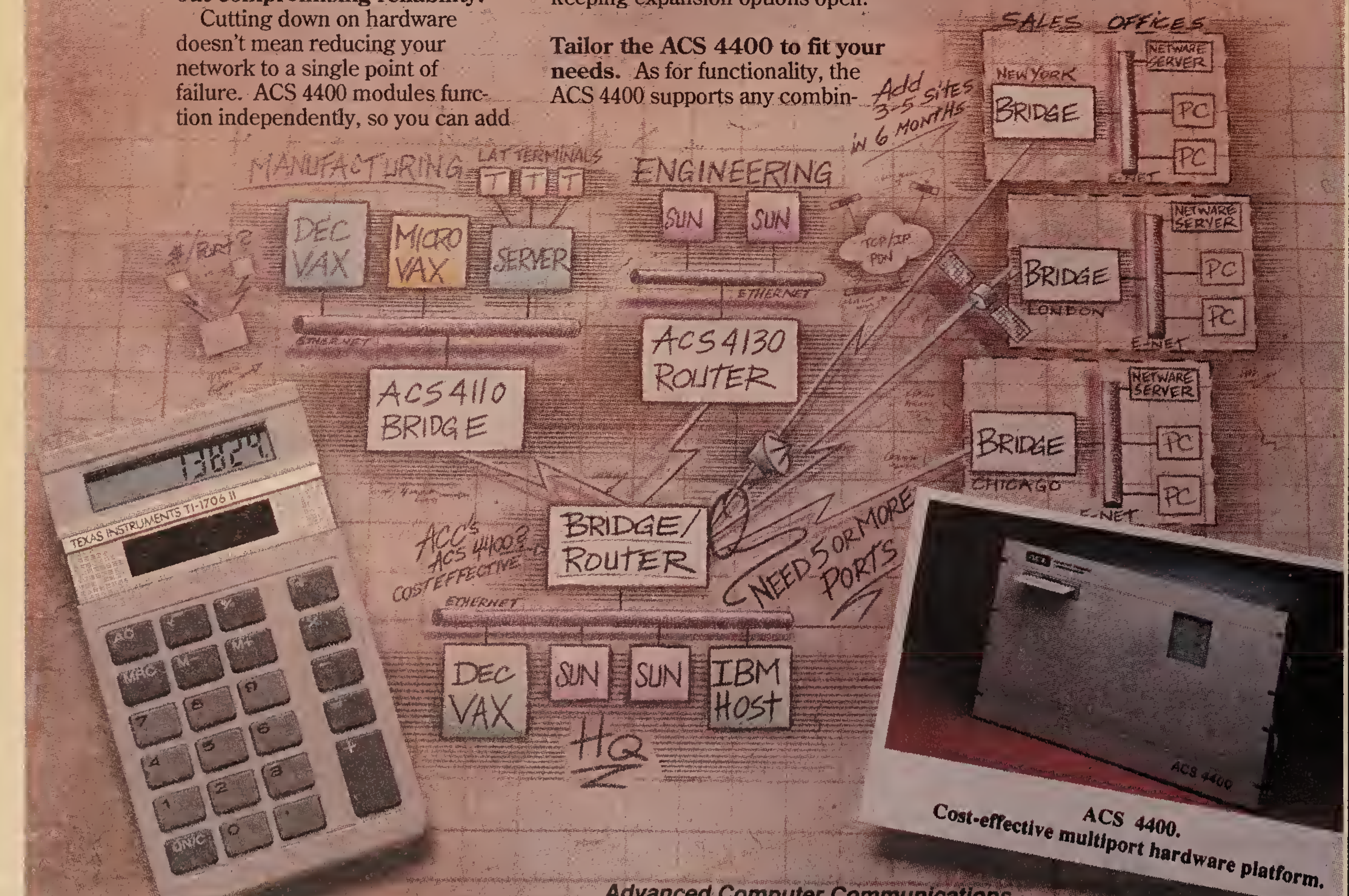

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Worth Noting

See inside for:

- Storage Dimensions' two new storage systems for NetWare networks.
- The Purple Series UT1616 Diskless Ethernet LANstation from U-Tron.

First Look

CASE/Datatel module links E-nets to WANs

CASE/Datatel, Inc. recently introduced a gateway that provides a direct connection between CASE/Datatel DCX wide-area networks and Ethernet local nets running Transmission Control Protocol/Internet Protocol.

The **DCX8023** is a Motorola Corp. 68020-based module that plugs into CASE/Datatel's DCX840 and DCX850 statistical multiplexers, allowing remote users to access hosts supported by an Ethernet.

As many as 64 local- and wide-area network users are supported per gateway, and each user can run up to four sessions simultaneously, with each gateway supporting a maximum of 128 sessions at a time, according to the company.

Customers can use a Digital Equipment Corp. VT-100 or compatible terminal plugged into the DCX8023 to display calls in session with source and destination addresses and connect times.

The DCX8023 is priced at $11,500. Delivery is 30 days after receipt of order.

CASE/Datatel, Inc., Cherry Hill Industrial Center, 55 Carnegie Plaza, Cherry Hill, N.J. 08003; (609) 424-4451.

Brouter links up to eight Ethernet LANs

Advanced Computer Communications recently unveiled a brouter that can link up to eight dispersed Ethernet local networks to form a single integrated network.

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Harris OS upgraded for Ethernet

By Tom Smith
New Products Editor

Harris Corp. recently enhanced the operating system of its Night Hawk minicomputer to enable the machine to be integrated into secure Ethernet networks from Verdix Corp. that Harris resells as the LAN/SX.

The CX/SX operating system, a secure implementation of Unix that Harris developed with AT&T Federal Systems, was enhanced to support an Ethernet interface.

This will enable Night Hawk minicomputers to support multiple levels of security on secure local networks. For example, a Night Hawk will be able to communicate with workstations that have secret, top secret or confidential clearance.

The company also announced the Harris 630/SX, an AT&T 630 Multi-Tasking Graphics terminal modified to provide a windowing interface that can support multiple sessions with different levels of security.

The products, which are part of Harris' plan to develop the SX Secure Operating Environment, are intended for government agencies or other users requiring secure data transmission, according to William Marlow, director of business development. Future offerings under the Secure Operating Environment will include a secure relational data base management system.

In addition to the interface that plugs into Night Hawk's VME bus, Verdix currently offers cards for Sun Microsystems, Inc. workstations, IBM Personal Computer ATs, Apple Computer, Inc. Macintoshes and Digital Equipment Corp. VAXes.

The interface encrypts data to be transmitted over the Ethernet using the Data Encryption Standard. The interface also supports an external device that accepts keys that dictate the level of secure data the user can send and receive. Users must enter a computer-generated password to gain access to the network.

A workstation, dubbed the Network Security Center, maintains security-level information about each node. It continuously monitors activity on the network, compiling a log of security-related events. The workstation also initializes nodes when a user inserts the key and provides a password, thereby defining which systems can communicate with

(continued on page 32)

Tektronix unveils protocol analyzer for token ring

SAN DIEGO — Tektronix, Inc.'s LP Com Division introduced a protocol analyzer for 4M bit/sec token-ring local networks at the Tele-Communications Association, Inc. conference here last week.

The token-ring analyzer comes in two versions: the TC 1000-B8, which is used solely to analyze token rings, and the TC 2000-B8, a module for the company's existing TC 2000 multifunction test system. The TC 2000-B8 can test a variety of protocols, including the Integrated Services Digital Network Basic Rate Interface, T-1 facilities and local nets such as Starlan.

The TC 1000-B8 is based on a Tektronix portable computer, while the TC 2000-B8 is based on a standard Tektronix personal computer. Both the portable and personal computers are IBM Personal Computer XT- and AT-compatible. The TC 1000-B8 is also available as a board-only module for use with existing machines.

The token-ring analyzer measures performance characteristics such as token-rotation time, which is the time required for a token to travel around the network. It also measures frequency of ring recoveries, which occur when a user disconnects a workstation from the network, breaking the ring and requiring the network to recover.

Other statistics provided involve utilization levels, which help the user gauge the amount of bandwidth being used, according to Jim Young, customer support engineer at Tektronix LP Com.

The product can help net managers plan future expansion by generating sample traffic loads to determine how the addition of network nodes would affect performance, Young said.

When not being used for testing purposes, the products can be used as personal computers. They can also support an internal modem to collect statistics from a remote token ring.

The TC 1000-B8 is priced at $15,600, the TC 2000-B8 costs $18,500, and the board-only system costs $10,950. All three versions are scheduled to be available in November.

Tektronix LP Com is located at 205 Ravendale Drive, Mountain View, Calif. 94043; (800) 825-8675.

Fujitsu enhances net management system

FMS 1000 Version 1.4 is able to process alarms for twice as many modems as earlier versions.

By Tom Smith
New Products Editor

SAN DIEGO — Fujitsu America, Inc. used the Tele-Communications Association, Inc. conference here last week to announce an enhanced modem network management system that can support up to 512 devices.

Version 1.4 of the Fujitsu Management System (FMS) 1000 processes alarms for twice as many modems as the earlier version. The FMS 1000 supports Fujitsu Leased Network (LN) modems that range in speed from 2,400 to 19.2K bit/sec. It also offers an enhanced management summary screen that provides real-time details about network activity.

Besides existing LN modems, the system will support newly introduced multipoint modems that send and receive data at different speeds for efficiency.

The microcomputer-based FMS 1000 includes software and two line interface boards for personal computers running MS-DOS and Microsoft Corp.'s Windows graphical user interface.

Both interfaces have four RS-485 ports, each of which can support 32 modems daisy-chained together, according to Chuck Roedel, vice-president of Fujitsu America's Data Communications Division. The system can manage 256 local modems and an equal number at remote locations.

Alarms are automatically relayed from afflicted devices to FMS 1000. Alarms concerning the analog portion of links include receive level strength, signal quality and phase jitter. For the digital portion, alarms can identify things such as streaming, which occurs when the request-to-send function remains activated indefinitely.

The system's enhanced summary screen gives the network administrator more real-time ability to respond to network activity. For example, the screen can now show if a modem has switched to automatic dial backup mode. Previously, the alarm screen would have signaled a problem, but to determine how the modem responded, users had to switch to another screen.

From a configuration menu on the summary screen, a user can reconfigure both local and remote modems, Roedel said. Operators configure modems by selecting templates that define parameters such as data rate and whether the modem is point-to-point or multipoint.

Testing and diagnostic menus enable users to perform both disruptive and nondisruptive tests, such as loop-back and bit error rate tests. A user can also enable or disable individual modems from the personal computer.

Version 1.4 is available now; it costs $7,995, including software, processor boards and the microcomputer. It is being offered to Version 1.3 customers as a free upgrade.

Fujitsu also announced a remote monitoring capability, dubbed RemView, that enables users at remote sites to use ASCII terminals to access a central site FMS 1000 to view alarm screens.

> Alarms are automatically relayed from afflicted devices to FMS 1000.
>
> ▲▲▲

Remote sites can track alarms and send messages to the central site computer informing the FMS 1000 operator how to respond to the alarm. RemView includes an interface board and software for the central site personal computer. Available now, it is priced at $1,295.

Fujitsu's new fast-poll multipoint modem, LN 19.2/9.6FP, is intended for inquiry-type applications such as account updates, according to the company.

The synchronous leased-line modem accepts inquiries involving a small amount of data, such as name and account number, at 9.6K bit/sec, and transmits outbound responses with more data at 19.2K bit/sec. These speeds provide maximum efficiency for the amount of data being transmitted in each direction, the company said.

The LN 19.2/9.6LN can support up to six modems in different locations over a single analog leased line. LN 19.2/9.6FP also has a two-channel feature so that two users at a location can share one modem. The modem costs $6,995 and is available now.

Fujitsu America is located at 3055 Orchard Drive, San Jose, Calif. 95134; (408) 432-1300

First Look

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The **ACS 4400** hub houses as many as four separate bridge or router modules, each of which has two serial ports that support point-to-point or X.25 links to remote Ethernets. Each module operates independently, allowing users to replace or add a network module or troubleshoot a network connection without disrupting communications among the remaining modules.

The ACS 4400 can monitor and control other ACS Series 4000 bridges and routers using the Simple Network Management Protocol. SNMP enables network managers to change parameters, modify routing tables and activate or deactivate network links.

An ACS 4400 brouter with four modules costs $20,500. The three-module unit is priced at $16,500, the two-module unit costs $12,500 and the single-module unit costs $8,500. Individual modules can be purchased for $5,500. All units are available now.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101; (805) 963-9431.

Two optical storage systems for NetWare networks debut

Storage Dimensions, a subsidiary of Maxtor Co., has introduced two optical storage systems for Novell, Inc. NetWare networks, the **LANStor Write-Once Optical** disk and the **LANStor Erasable Optical** disk.

The 786M-byte LANStor Write-Once Optical disk is Storage Dimensions' first write once, read many optical storage system for NetWare. It is attached to the net through a networked workstation running LanShare software, which acts as a file server.

The LANStor Write-Once Optical disk is available in single- and multiple-drive configurations. Each includes a host bus adapter (IBM Personal Computer AT or Micro Channel Architecture), LanShare software, a removable 5.25-in. optical data cartridge and user documentation for installation.

The LANStor Erasable Optical disk provides 1 gigabyte of erasable data storage on a cartridge. The drive can be attached to a networked DOS workstation running LanShare software, or it can be connected to a NetWare file server so that DOS and Macintosh files can be written to it.

The LANStor Erasable Optical package comes with LanShare software, cables, a host bus adapter, a data cartridge and user documentation.

The LANStor Write-Once Optical ranges in price from $4,995 for a single-drive unit to $10,495 for a multiple-drive unit with a 155M-byte hard disk. The complete LANStor Erasable Optical package is priced at $8,495.

Storage Dimensions, 2145 Hamilton Ave., San Jose, Calif. 95125; (408) 879-0300.

Modular muxes give users flexibility in net configuration

U-Tron, Inc. recently announced the **Purple Series UT1616 Diskless Ethernet LANstation.**

The LANstation is based on Intel Corp.'s 80286 microprocessor and comes with 1M byte of random-access memory, expandable to 8M bytes; an Ethernet or Arcnet network card; and read-only memory or programmable ROM modules, including remote boot software to start up remote diskless workstations.

The workstation also comes with either a monochrome graphics adapter (MGA), enhanced graphics adapter (EGA) or video graphics adapter (VGA) video card. The Ethernet LANstation with MGA is priced at $1,895; with EGA, $2,095; and with VGA, $2,195.

The Arcnet LANstation with MGA is priced at $1,695; with EGA, $1,895; and with VGA, $1,995. All versions of the LANstation are available now.

U-Tron, Inc., 243 Charcot Ave., San Jose, Calif. 95131; (408) 943-1920. ◼

Harris OS upgraded for Ethernet

continued from page 31

others. It also provides encryption key management, downloading encryption information when a host is initialized.

CX/SX overcomes the single-user, single-level limitations inherent in the original Verdix product by allowing Night Hawk to support multiple levels of secure data. This means Night Hawk can communicate with workstations cleared for various security levels.

"That's the nice part about having a multilevel secure environment," Marlow said. "Now users can take full advantage of the computing power of the machine."

Night Hawk can also be used as a gateway between multiple secure local nets, checking passwords and electronic keys to grant and restrict access as necessary.

Night Hawk supports the new 630/SX terminal via an RS-232 connection and enables users to have as many as 14 windows displaying data from two processors. Windows containing data with different levels of security can appear on the screen simultaneously if the user has the proper clearance.

The Network Security Center hardware and software cost $24,500. Interface boards required for each node, including Night Hawk, cost $4,500. Both products will be available in the third quarter of 1990. The 630/SX terminal costs $5,200 and will be available at the end of October.

Harris can be contacted at 2101 W. Cypress Creek Road, Ft. Lauderdale, Fla. 33309; (800) 666-4544. ◼

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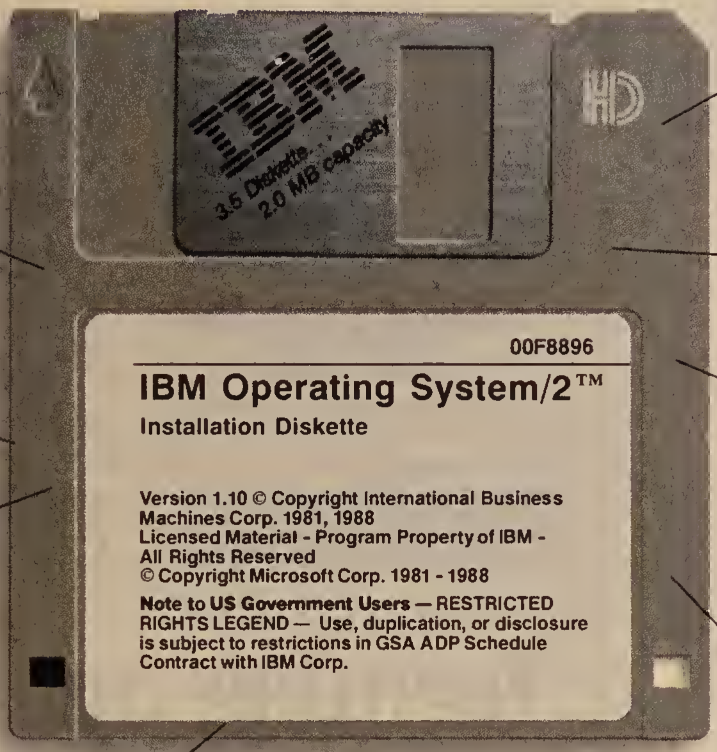
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OPINIONS

INFORMATION TECHNOLOGY

BY JAMES KOBIELUS

Create today's virtual office by remote control

The tendency of modern organizations is to reach across new dimensions of geography, time, function, jurisdiction and task in pursuit of their goals. It is not necessary that employees work near each other, or even that they be personally acquainted. They may be complete strangers to one another, separated by oceans and time zones, each playing a small part in some larger task none of them totally comprehends.

Granted, this is not a new phenomenon. ''Remote control'' as a principle of organizational design goes back several millenia, finding its earliest expression in far-flung state bureaucracies such as Imperial China.

Still, there's little doubt that modern information technologies have accelerated this age-old trend. In the process, they have enabled companies to explore an ever wider range of organizational forms suited to their business needs. The technology itself becomes the axis of organizational redesign.

Bear in mind, however, that remote control as a design principle cuts two ways: toward greater centralization or greater decentralization. On one hand, it may imply monitoring and manipulation from above by distant, unseen movers and shakers.

On the other, it can refer to giving dispersed, frontline users access to any resource they require — communications channel, application, data base, person or utility. Almost any organizational redesign has the effect of empowering some groups and displacing or eliminating others.

Automating a formerly labor-intensive billing operation on a mainframe in Omaha, Neb., may displace whole departments in a converted warehouse in northern New Jersey. Giving line managers in sales, production and distribution access to a shared order-entry data base may render obsolete a significant chunk of corporate staff whose job it was to coordinate those operations.

In the majority of cases, however, the organizational impact of information technologies is more indirect and subtle. Functions and activities are redistributed in piecemeal fashion instead of en masse. Or the computer and communications network may create an environment conducive to the formation of new work groups.

For example, establishing an electronic mail or videoconferencing link between dispersed sites may not necessitate an immediate rewrite of job descriptions or the organizational chart. But it can spawn a wide variety of informal dispersed business teams. Teams form on an as-needed basis as scattered individuals meet electronically.

Under such circumstances, the only evidence of a team's brief existence may be the messages it exchanges and the results it produces. No group photo is possible; no office suite need be dedicated for its exclusive use.

Therein lies the power and beauty of information technology: It lets organizations redesign themselves on the fly. Remote users coalesce to carry out the task at hand, then fall back into their positions in the mainline corporate structure. In a sense, this is the matrix organization with a vengeance.

One might compare these fleeting work groups to software in that they overlay the ''hard-wired'' mainline corporate structure.

The groupings are merely expedients created to serve specific purposes and may easily be dissolved when they have served those purposes.

Which is as it should be. Organizations are mankind's tools for adapting to and gaining a measure of control over a changing world. They must change to meet ever newer challenges. Otherwise, they run the risk of ossifying and perpetuating the outmoded ways of yesteryear.

Kobielus consults on information technology in Alexandria, Va.

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Network World
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
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501 Second Street, Suite 600
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EDITORIAL

Farming out net management makes sense only for some

Merrill Lynch & Co., Inc. stood common sense on its head when it recently announced that it will have MCI Communications Corp. and IBM take over the day-to-day operation of its network. While facilities management isn't unheard of, the idea of a network-dependent company such as Merrill Lynch concluding that it makes sense to farm out management of its net challenges long-established precepts.

How can companies hope to use networks for strategic advantage if they give up control of the very backbone? What happened to ''Be your own Bell?''

Merrill Lynch and others have concluded that it is not as important to run the network as it is to control what is run over it. While there are many sound reasons behind this thinking, the tack is controversial. Some users say that giving away control of transport networks can limit efforts to compete.

Proponents of third-party facilities management argue that voice and data transport networks are commodity items today, and there is little strategic value in maintaining day-to-day control when an outside party can do it as well or better. Vendors, they say, are better equipped to contend with the relentless advance of technology and can more easily attract and maintain the staff necessary to manage a complex network.

Washing their hands of operational details frees up time to focus on the big picture — the application of networking technology for business gain.

''We want our resources focused as much as possible on strategic applications such as videoconferencing, electronic data interchange and high-speed imaging and graphics,'' says Robert Forte, director of communications services at United Technologies Corp. ''We don't think there is much of a benefit from managing the commodity parts of communications, such as dial tone and private networks.''

> Washing their hands of operational details frees up time to focus on the big picture.
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Opponents of farming out network operations salivate at the idea of having the time to focus on truly strategic applications, but argue that farming out has too many pitfalls. Can vendors be trusted to manage in your best interest? How do you hold a facilities management firm accountable?

Given the difficulty of staffing and the critical nature of having staff that is familiar with your operation, how hard will it be to bring services back in-house if the vendor doesn't live up to expectations?

These are only some of the most obvious questions. More fundamental is the question about whether transport networks can actually offer a competitive advantage in this day and age. We think so.

Citibank, N.A., for example, has a global fast packet-switching network that is better than funds transfer networks shared by a number of competitors. Interbank settlement rules give banks 24 hours to complete customer transactions; most banks initiate payments prudently to avoid stiff penalties for late transactions.

Citibank's high-speed network lets it pay debts at the last minute, giving it hours of float time during which it can lend against those funds at money desks in different time zones around the world. The network is said to make the company millions of dollars.

Would it make sense to trust that transport network to an outside vendor? Probably not. The decision of where and when to farm out facilities management is really a matter of application.

Our gut feeling is that third-party facilities management is really only a reasonable option for the biggest firms that have control over their vendors and the wherewithal to reassemble the pieces if the deal goes sour.

THE ENTERPRISEWIDE NETWORK

BY JAMES HERMAN

Integration is dead: Long live interconnection

Just a few years ago, network planners were hard at work looking for ways to reduce the number of networks in their enterprises. There were just too many networks, and managing all of them had become too difficult. Many analysts had a goal of reducing the overlapping web of different networks to a single, integrated backbone that would meet all of an organization's communications needs in an efficient, unified way.

It may be time to give up on this program of integration, however. We are faced with an explosion of local networks from a multitude of vendors, many of which are linking up via bridges and routers to form a new generation of overlapping wide-area networks.

Just when it seemed that progress was being made in reducing the number of application-specific networks based on IBM's Systems Network Architecture, Binary Synchronous Communications and Digital Equipment Corp.'s DECnet, the full magnitude of the multivendor local net problem comes into focus. We appear doomed to continually relearn the lessons of history.

Physical networks also abound. Although the T-1 backbone may be a common foundation for multiple communications needs, it has not really succeeded in reducing the number of nets in an organization.

Most companies also have one or more low-speed, multidrop networks to link 3270-type terminals to large mainframes. These organizations may also have a very small aperture terminal satellite network, even though fiber transmission will make terrestrial networks more economical. They may have an X.25 packet network, even as Integrated Services Digital Network products and services begin to hit the market.

If the business operates globally, then a plethora of new public and private international and overseas networks must be accommodated. The future holds a constant stream of new types of networks, such as metropolitan-area networks and those based on broadband ISDN, Fiber Distributed Data Interface and fast packet-switching technology.

It is now clear that an enterprisewide networking strategy must allow for many types of networks at different life cycle stages, optimized differently for scope, scale, performance and cost. Deriving competitive advantage from telecommunications requires an approach that can quickly and easily absorb new technologies and services while continuing to reap the return from prior investments. What is needed is a communications architecture that is inherently multinetwork and multitechnology.

What is needed is a communications architecture that is inherently multinetwork.

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Although an architecture that embraces voice, video, image and data is not yet defined, a solution that encompasses the varied data needs of the enterprise is gaining increasing support. This internet architecture calls for the creation of a network of networks, or metanetwork, to provide a basic set of uniform, end-to-end data services that transcend the network-specific capabilities already in place.

Rather than replace those technologies, this strategy attempts to synthesize an enterprisewide utility by interconnecting existing networks.

There are two key concepts that are the cornerstones of the internet approach: common host-to-host protocols and universal addressing. The internet approach achieves an enterprisewide utility by standardizing the endpoints, not the intervening networks.

Such an approach promotes diversity at the network level but enforces a single host-to-host transport protocol standard that simultaneously ensures interoperability and uniformity of service. The internet approach focuses on making an interoperability stack part of every device's network software. This core set of protocols serves as a lingua franca for the enterprise and a base for the sharing of data and computing resources.

This powerful simplification is then coupled with a universal addressing scheme that allows any device in the organization to locate and route to any other device using a standard and consistent format. By using an internationally managed addressing standard that assigns every enterprise its own unique portion of the global address space, any two devices can be linked when needed and communicate naturally without fear of address overlap or incompatibility.

Although T-1 creates a very useful transmission backbone, it does little for the enterprise beyond providing inexpensive bandwidth. Few businesses can point to their T-1 networks as strategic resources.

The internet strategy, however, has enormous payoffs in flexibility and, more importantly, interoperability. It promotes diversity in computing and networking for a relatively minor price: the use of a small set of common protocols and a universal addressing standard. It simultaneously allows for the rapid introduction of new technologies while preserving prior investments.

Today's clear choice for internetworking is the Transport Control Protocol/Internet Protocol family. The only serious alternatives are the newer Open Systems Interconnection protocols or proprietary stacks from IBM and DEC.

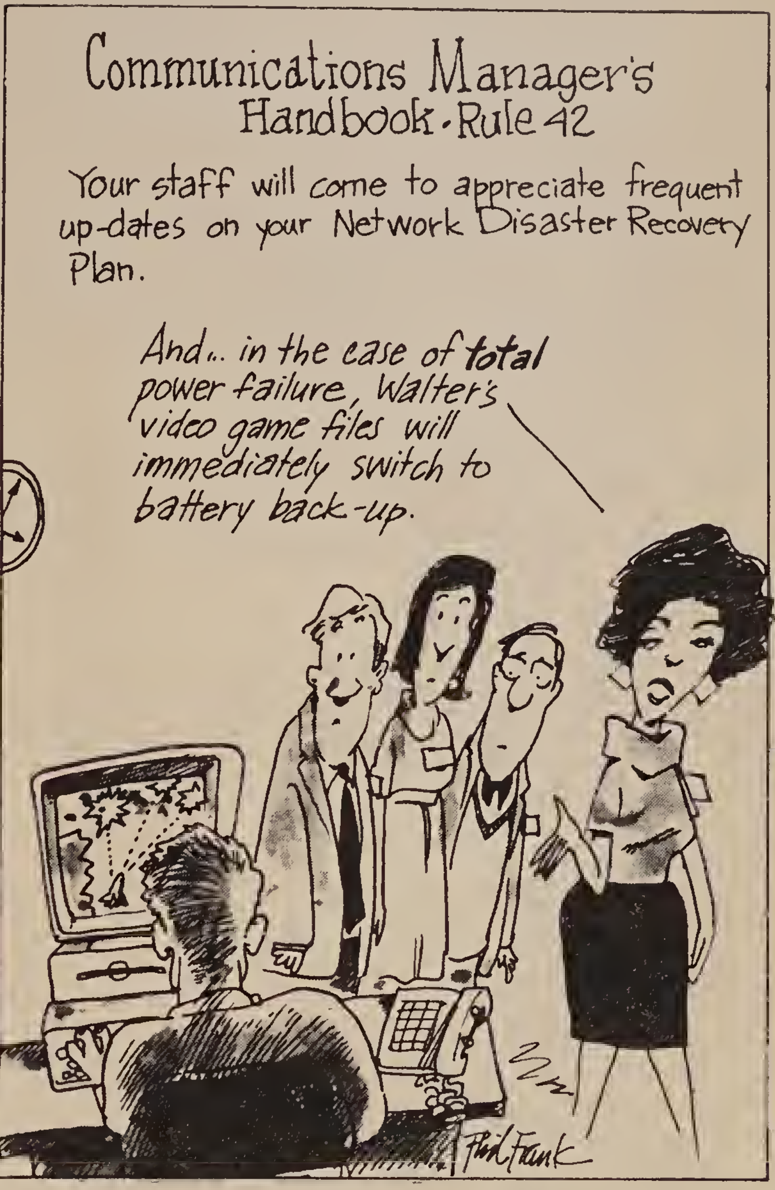
TCP/IP is available for a much wider variety of platforms than the alternatives. Choosing SNA as the enterprise interoperability standard is like choosing the wolf to guard the henhouse. IBM will never be able to manage SNA as a true multivendor standard. The OSI protocol stack, which DEC is incorporating into DECnet, will be an increasingly important alternative in two or three years, but at the moment, it is just too new. Over time, hybrids of TCP/IP and OSI will become the interoperability standards of choice for most enterprises.

The strategic networking issues are interconnection and interoperability. If you are still concentrating on integration, you may be working on the wrong problem. ◻

Herman writes, teaches and consults on telecommunications technology with Northeast Consulting Resources, Inc. in Boston.

TELETOONS

BY FRANK AND TROISE


Communications Manager's Handbook • Rule 42
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LETTERS

Small firm bonanza

The article "Broadcaster group dumps mini for versatile local net" (*NW,* July 31) missed a critical aspect of the tale: The lower cost of software development in the personal computer environment permits small and midsize organizations to purchase custom software at a level of sophistication once available only to much larger firms.

The National Association of Broadcasters (NAB) was able to contract for the development of custom application programs that provide a complex broadcast industry data base, membership management and dues billing with an interface and process control tailored to its highly specific needs.

This was affordable and technically feasible today because small systems houses can deliver custom software at prices appropriate to the budgets of organizations such as NAB. Today, a small systems

(continued on page 46)

Network World *welcomes letters from its readers.*

Letters should be typed, double-spaced and sent to Editor, Network World, *375 Cochituate Road, Box 9171, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

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If you'd like to write a column, call Steve Moore, features editor, at (508) 820-2543, ext. 732, or fax your idea to us at (508) 879-3167.

Lies, damned lies, and data communications

CONTINUED FROM PAGE 1

Few users are willing to talk on the record, lest they publicly antagonize the very vendors they're castigating in private. This fear may be more perceived than real; there are few firsthand stories of vendor retaliation or threats. But enough are willing to speak to give us a fair picture of what's going on, how the vendors feel about it and what users can do to protect themselves against such tactics.

There are more than enough examples: The telecommunications director of a large commodities exchange recalls opening modem boxes and finding a $100 bill inside each one. He also relates offers of free trips to Bermuda in exchange for large purchases.

Hub Vandervoort, senior telecommunications analyst for CTG/TMC, a telecommunications consultancy in Needham Heights, Mass., has a story of vendor subterfuge and sabotage that occurred when he was involved as a consultant for a user.

"It was a very competitive T-1 bid," he recalls. "It had come down to the shortlist of two vendors; equipment was installed, stress-tested and evaluated.

"By coincidence, the rep from Vendor A was in an airport at one of those 'islands' of telephone booths. From the other side, he heard someone from Vendor B talking about the account, saying his field engineer put jumpers in the other company's equipment," Vandervoort says. "Basically, he had sabotaged Vendor A's equipment so it wouldn't perform as well as their own.

"The rep from Vendor A walked around the island, handed the guy from Vendor B his business card and said, 'Hi, maybe there's something we can do to help.'

"Vendor B withdrew its bid the next day."

How vendors sell to users depends on several factors, according to Victoria Blackford, who has

(continued on page 40)

Guptill is the features writer for Network World.

You can fool some of the people
some of the time,
but they won't like it.

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If you're not using AT&T 800 your calls could be sharing the same fate.

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MAY 28, 1968
VANISHED
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APRIL 5, 1956
LOST
AIRFORCE JET
AUG. 28, 1963
AT&T
The right choice.

(continued from page 36)

been on both sides of the user/vendor fence. Formerly vice-president of data communications for The Chase Manhattan Bank, N.A. in New York, Blackford is now national market manager for financial industries with Digital Communications Associates, Inc. of Alpharetta, Ga.

"It depends on the type of sale," she says. "Is it a system sale or a black box sale? That will affect the people the vendors talk to in the user company.

"How they sell is also dependent upon the level of knowledge of the user and the maturity of the product. In less mature markets, there's obviously much more need for education, much more hand-holding. Some vendors will try to do anything they can, especially in a real dog-eat-dog market."

Mudslinging

In a tight market, some vendors resort to knocking their competition. That can easily work against the vendor doing the knocking.

"They should be selling their strengths and not the weaknesses of the competition," Blackford says. "Selling against competition does and doesn't backfire; it depends on the user you're talking to. If the users are professional individuals, they will probably look askance at that type of behavior."

One often-heard story that circulates around trade show floors is of vendors who threaten to withdraw support for installed equipment if the user buys equipment from another vendor.

According to the stories, such threats are rarely made outright. Rather, users may get a warning about major incompatibilities between the new equipment and the installed system, which could void the warranty or damage the installed equipment. A withdrawal of future support may be implied, or the user may not receive upgrades when necessary or promised. Such stories inevitably involve large vendors, especially systems vendors or carriers.

Here's one scenario: A new product comes to market that is more strategic for a vendor than its existing product. The vendor wants to migrate users to the new one.

"[The vendors] try to get you to buy the new one with the threat of 'We're not going to support this product,'" Blackford says. "I was involved in a situation where the vendor said, 'The support for the existing product, software upgrades and leases will go away in X amount of time.' My peers and I went to my boss to tell him. He said, 'You think they're going to do that? You gotta be crazy.' He was right. Nothing of the sort happened. He had clearly been through the same sort of thing before."

Such behavior isn't as prevalent in the carrier world since divestiture, Blackford adds.

"Threats of interconnections voiding warranties were prevalent before deregulation," she remembers. "I don't know if [carriers] can really effectively do it anymore. There's so many pieces of equipment on the market now.

"What they say now is, 'If you buy that other product, clearly any network management problems will start there.'"

In Vandervoort's experience, the fear goes the other way.

"When I was with NCR Comten, clients would always raise this fear that 'If I buy your box, even though I've still got an IBM mainframe, IBM will drop support or even lessen the importance of the account,' he recalls.

> Some vendors resort to knocking their competition.
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"My experience was that when a customer selected a non-IBM box, IBM actually improved relationships with them because IBM's immediate fear was that it might lose its foothold."

Uneasy allies

In private life, few people are willing to do business with friends or relatives. The potential is too great for problems; a bad deal, perceived or actual, can sour the best relationship.

The implications are worse for user companies owned by or allied with vendors. Take the case of Ed Ward, network services manager for American Management Systems, Inc. (AMS) of Arlington, Va., which develops mainframe software for various vertical markets. Ward is in the market for a new private branch exchange to handle expanded operations. The company currently has an IBM/Rolm CBX installed.

"With multiple sites in the same local access and transport area, we're looking at what Centrex will do for us," Ward explains. "Since we started that analysis, IBM has bought 10% of our company, and we formed a joint venture with Bell Atlantic [Corp.] I can't pick anyone without ticking somebody off."

Ward is also experiencing similar pressure from his own customers. His department recently began an analysis of the company's long-distance alternatives.

One of the company's top markets is telecommunications; among other products, AMS has developed billing and payroll packages for interexchange carriers. The close relationships formed with its own customers is affecting AMS' search for long-distance services.

"I found out that what could have been a fairly simple process and probably didn't merit much analysis — perhaps nanocents difference in per-minute costs between some carriers — has become a very involved process," Ward says, "because almost everyone we're looking at now knows that we're looking and does business with us. There is an unusual tendency to have a lot of fingers in the pie all at once.

"I'm talking about 'end runs,' where our CEO is meeting with the carriers — as customers — and they say, 'Oh, by the way, we're looking to get some of your long-distance business. Why is it that we don't have any?'

"It's gotten real interesting real fast," he says wryly. "What could have been a two-month process is probably going to take six months."

End runs such as the one described by Ward are unfortunately not unusual. "Going over people's heads is probably the most common thing I see, especially in desperation," Vandervoort says. "When a competitor knows he has fallen behind and really doesn't have any more ammunition, he'll start short-circuiting the people he's dealing with and go up to the top.

"It always backfires; I've never seen a case where it worked. It may work in the short run, but eventually it fails."

"Vendors would often think of [going over my head]," Blackford says. "I know of specific instances where vendors have gone over heads and have blasted the hell out of a person to his manager." She agrees that it backfires more often than not.

"You appear to be telling the manager that he has a horrible person working for him," she explains. "That's not a real compliment to the judgment of the manager or the organization."

Promise me anything

A tried-and-true sales tactic in any field is the selling of future products or features.

"It's the old, 'I'm sure it's going to be available next quarter' line," says Brian Jay Gould, vice-president of Network Design Corp. of Omaha, Neb., who works out of Dayton, N.J. "As a consultant, I might recommend something that's incompatible with what the vendor has; what I need is not what they have. So the vendor says they *will* have what I need; they just don't have it now."

"What typically gets dropped [in such conversations] is the verb tense," adds Len Evenchik, director of data communications for the Commonwealth of Massachusetts. The question then is: How do you defend yourself against such promises?

"We ask when the first operational date was for a particular feature or function," Evenchik says. "When asked that direct question, nobody is foolish enough to lie about it. Just make sure if it *has been, is* or *will be* implemented."

"One of the problems with signing future deliverables is the penalties," Gould says. "Don't spite yourself with penalties. That's what a lot of people do wrong. They write something in the sales contract that's too restrictive and negatively impacts their own operations. Therefore, they won't invoke the penalty, and the vendor gets off scot-free. The penalty should be something like, 'You're going to give it to me anyway, but at half price.'

"Let's say it's a software tools package. Tell the vendor, 'If you don't provide the tools on this date, you will provide on-site programmers and we will write the code together.'"

Gould encountered a similar situation a few years ago when the vendor agreed to provide eight programmers free of charge if the package was not delivered on time. It wasn't, and he got the eight programmers.

Sins of omission

Sometimes, instead of promising a future deliverable, the vendor will simply "forget" to tell the buyer that a certain feature or product isn't available. Such sins of omission are common tales of woe among users.

One former consultant for a well-known network design firm, who requested anonymity, told of situations where he and his associates would do presentations on network designs to potential clients in which parts of the design or management packages were planned products rather than real products.

> "We 'forgot' to mention it was a planned function.
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"We just 'forgot' to mention it was a planned function vs. what was available today," he says. "It was a sin of omission."

"There's a great defense against these tactics," Gould says. "All you do is ask them to sign a contract that states that everything in the proposal will be delivered within the terms of the proposal. Most companies will say, 'We won't do that.' My response is, 'OK, just tell me what it is that you won't do, and we'll take it out of the proposal.'"

Sometimes, the more aggressive vendors will lie outright about their own products or about their competition.

"There are vendors who misbid purposely to make it look low, to get you hooked on the business," Blackford says. "Obviously, you're not going to throw them out once they're installed. So your configurations are really out of whack."

"Often enough, you will get a salesman who is out to deceive," Gould adds. "I've had many a salesman make misleading comments, not so much about his own products, but more about someone else's. It backfires with me; but if they do it, it must work with someone."

"It may come up in competitive comparisons where vendors are asked to directly compare their wares against others," Blackford explains.

But is that an excuse for some of the mudslinging that goes on among vendors?

"If you have to denigrate the competition, you'd better find some strengths in your own product," Blackford asserts, "or go find another product to sell."

Defensive tactics

In any case of potential deception, the best defense is education. If you understand the products and the applications, you stand a better chance of getting what you want with fewer headaches.

"I've got a vendor with whom I've had many years of successful relationships, and the products are outstanding," Gould says. "Unfortunately, I have to work through a local salesman who's deceitful and deceptive, mostly through omission. But I already know the products, so I know what I want. The salesman has tried to conceal what his product won't do. I know what it won't do, and I know how to get around it."

"You've really got to know what you're talking about and looking at," Blackford seconds. "Education definitely helps; knowing what questions to ask, being analytical enough to go through quotes and ask, 'What does this do, and how does it work?'"

"In part, you can adopt some government bureaucracy tactics where everything is rigidly formalized," Vandervoort adds. "You might be able to alleviate things that way; it's a matter of specifying deliverables. But can you realistically come to such a well-defined spec up front without either costing millions of dollars or wasting tons of time?"

Evenchik thinks users can.

"Formalize the process," he says. "That assures the vendors that they know who they're dealing with; it forces them to give it their best shot. They know other vendors will be speaking to the client.

"If you don't formalize the process and nail down the requirements, it's very difficult — if not impossible — to do an apples-to-apples comparison ("You say tomato, and I say throughput," *NW*, Aug. 28). The processes are no more involved in the public sector; any large organization has a procedure to go through."

Vandervoort thinks openness is the way to go.

"In the course of business, I like to keep as many of the cards

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face up as possible," he explains. "There are buyers who say, 'I won't even trade any information about who is bidding, much less about the solutions they may be proposing.'

"You can't divulge too many things, but by keeping things out in the open, you know what your competitive environment is like, and the truly better solution will emerge. There's little chance of deception at that point."

Vandervoort champions the idea of a buyers' information exchange listing information about vendors by name.

"There's probably a lot of merit to starting a bulletin board-style conference on this with some sort of well-advertised, central repository of information on past sales history," he says. "Still, one would have to be very accurate in any claims [made against vendors]."

Equal time

The two vendors mentioned most often as transgressors are IBM and AT&T. They are also the two largest and best-known companies doing business in the communications marketplace.

"While we want our sales force to make deals, obviously the last thing we want to do is queer any future deals by upsetting the people we're dealing with," says Burke Stinson, an AT&T district manager. "As a practice, we certainly want to exhaust all avenues to make a pending sale, stopping short of upsetting people."

One complaint heard is that AT&T has a sales policy that instructs salespeople to convince users that their current systems are obsolete.

"Do we expect our salespeople to go to customers and say, in effect, that [their] communications arrangements are obsolete? Without knowing the salespeople involved, I would have to say that it is not a tactic we condone," Stinson responds. "That's a questionable practice and seems less than professional.

"Our policy is mostly how to sell a particular product or service, to tie it into a particular customer's needs. It would be foolhardy to tell customers what they need unless they ask for it. We emphasize that the salespeople are supposed to be acting as agents of, and partners with, the customer," he explains.

Does Stinson think AT&T and IBM may get targeted for complaints simply because they're the largest vendors?

"A person who wants to use an example but doesn't want to have to explain much about the company being criticized could easily use a name-brand company, rather than a company that's not as well-known," he says.

Both IBM and AT&T have recently redeployed thousands of former staffers to front-line sales jobs, putting relatively inexperienced people in pressure situations. Also, AT&T is still adjusting to the effects of divestiture; prior to 1984, Ma Bell was the only game in town. Could some of the sales force be having trouble dealing with competition?

"We don't want them to be too pushy or laid-back," Stinson says. "I'm sure we have people on the sales force who are too passive, and I suppose there are people who are too aggressive as well. We're looking to eliminate both.

"We do regret that there are people complaining about us; we hope to get the chance to do it better the next time."

The majority is moral

So is the world really filled with bad guys out to stab us in the back while patting us on the shoulder?

"I really don't think the majority [of vendor salespeople] are lying or misrepresenting," Gould says. "I really think the majority are honest and trying to do the right thing.

"But remember who they're talking to within their own company. Someone in development may say 'We're working on this.' Marketing doos not want to tell sales anything until things are released and the customer knows all about it. But the customer probably knows before the salesman," Gould says.

"So in order not to sound like an idiot about your own products, you've got to say *something*. A good salesperson talks to people in development, reads the trades and figures out what to say. It may not be the company line, and that causes problems."

"Trusting the vendor is the issue," Vandervoort says. "When they resort to less-than-ethical tactics to win business, what will they do to keep business?" ◼

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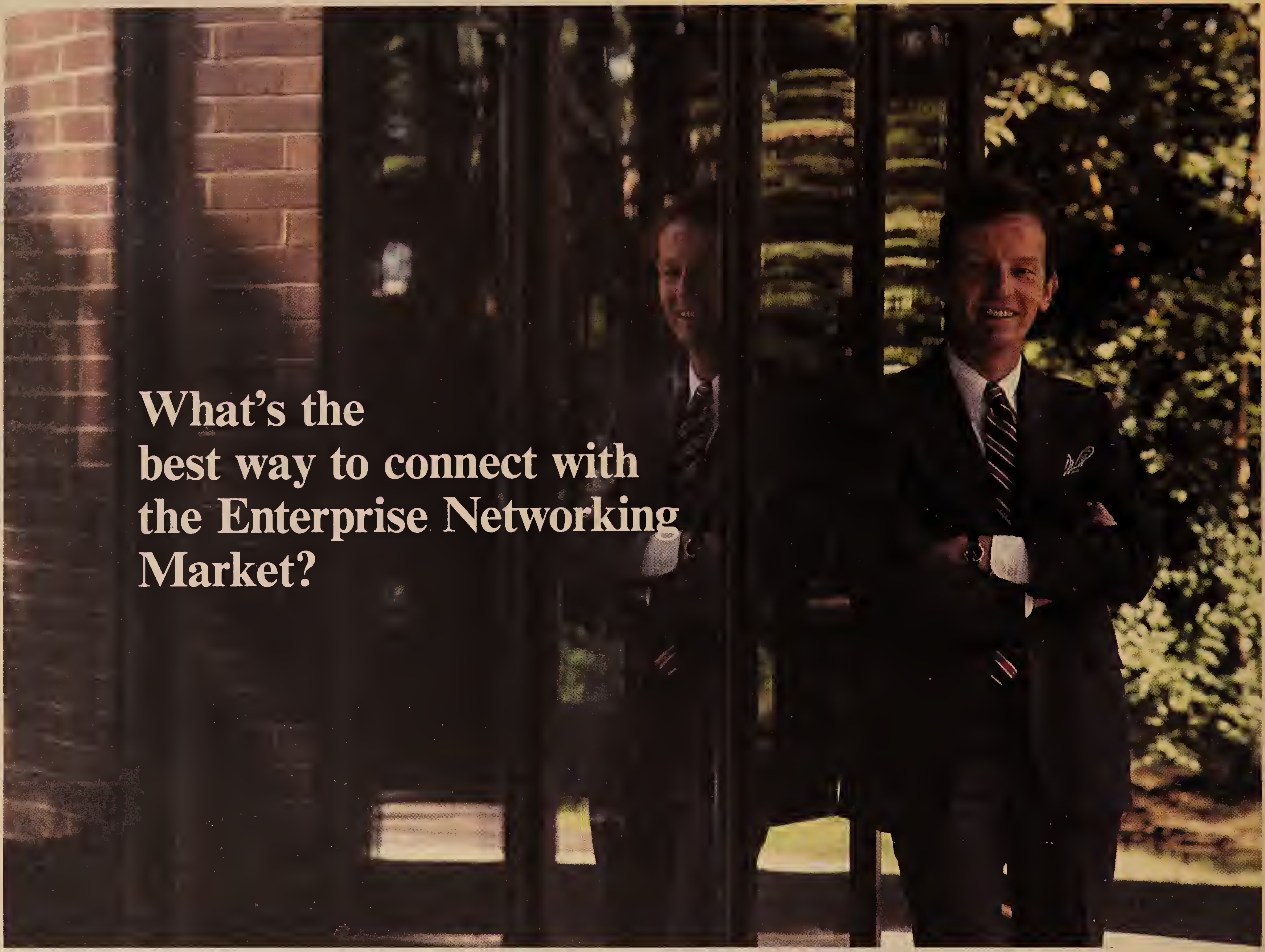
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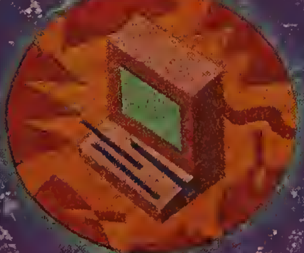

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BUYER'S GUIDE

DATA SWITCHES

A switch in time

By JAMES PRUITT

These days, the data switch is caught in a struggle against three threatening forces. The data switch closely matches the local network in functionality, with its physical support for disparate terminal types, its inherent terminal-to-processor contention and its ability to connect terminals with any required host through gateways or routers, depending on the requirements.

CHART • GUIDE

A chart comparing data switches from a variety of vendors is on page 44.

Local networks have usurped the data switch's role as the terminal-contention device and have added value to its traditional ability to furnish terminal contention in a network. The proliferation of local nets is competing directly with both data switches and statistical multiplexers.

Pruitt is an associate at Perot Systems, a systems integration firm in Dallas. His book, Microwave in Corporate Networks, *will be published this fall by John Wiley & Sons.*

The second threat to data switches is the movement away from dumb terminals to personal computers, which are capable of local processing as well as traditional terminal functions. Personal computers are capable of many of the protocol conversions that, in a terminal-to-host environment, once required the use of a protocol converter or data switch.

Finally, the sanctity of host processors themselves, with their data switch front ends, is being seriously challenged by the tributed processing networks of communications facilities and regional processors. Even local networks of distributed personal computers within departments are running applications that, mere months ago, ran only on a mainframe.

The data switch fights for a place in the sun.

Data switch functionality

Data switches or private branch exchanges provide contention services, which allow many terminals to contend for a small number of ports on one or more host computers. Usually, data switches are used to allow a group of occasional terminal users to connect to a small number of computer ports on minicomputer or mainframe hosts.

(continued on page 44)

NETWORK WORLD

Data switches

Vendor	Product	Maximum user side ports/data rate (bit/sec)	User port interfaces supported	Maximum number of net side ports	Flow control supported	X.25 user port available	Local nets supported on user ports	Toggling between sessions supported	Protocol conversions available	Redundant equipment	Price range
Applied Innovation, Inc. **Columbus, Ohio** **800-247-9482**	AI Switch 90 & 180	256/not specified	RS-232, RJ-41	6	Xon/Xoff	Yes	None	Yes; number not specified	ASCII to X.25 (1984 convention)	Power, logic	$2,000 to $29,000
AT&T Data Systems Group **Morristown, N.J.** **(201) 898-3842**	Information Systems Network	2,500/19.2K	RS-232	1,920	RTS/CTS, Xon/Xoff	Yes	Ethernet, Starlan 1M and 10M bytes	No	None	Power	$17,000; depends on configuration
Develcon Electronics, Ltd. **Willowdale, Ont.** **(416) 495-8666**	Develnet	64,000/38.4K	RS-232, RS-449, V.35	64,000	All in- and out-of-band methods	Yes	Ethernet, TCP/IP	Yes; 63	Asynchronous, X.25, TCP/IP, 3270 SNA/BSC	Power, logic	$5,000; depends on configuration
Dynatech Communications, Inc. **Woodbridge, Va.** **(703) 550-0011**	CTM Series 901V	2,048/19.2K	V.35, RS-232-C, RS-232-D, four-wire, voice frequency, RS-366, X.21	2,048	20 leads of interface	No	None	Transparent to protocol/ application	No	Power, processor	Depends on configuration
Equinox Systems, Inc. **Miami** **(305) 255-3500**	DS-15	1,320/19.2K	RS-232, RS-422, RS-423, Current Loop	1,320 (shared with user side - universal ports)	RTS/CTS, Xon/Xoff	No	Ethernet	Yes; 8	Speed, parity, flow control conversions	Power, logic	$9,500 to $150,000
Ericsson Business Communications **Anaheim, Calif.** **(714) 533-5000**	MD-110	12,000/64K	RS-232-C, V.35	12,000 (shared with user side - universal ports)	Not specified	No	None	No	None	Logic	Depends on configuration
Gandalf Data, Inc. **Wheeling, Ill.** **(312) 541-6060**	PACX 200, 2000	1,920/19.2K asynchronous, 64K synchronous	RS-232 (V.24/V.28), RS-422	1,920 (shared with user side - universal ports)	None, but up to 4 signals passed through each direction	Yes	None	Yes	No	Power, logic	$4,700; varies with configuration
General DataComm, Inc. **Middlebury, Conn.** **(203) 574-1118**	DSS 120 & 360	1,320/19.2K	RS-232, RS-422, Current Loop	1,320 (shared with user side - universal ports)	Up to 6 user-selectable	No	None	Yes; 8 maximum	No	Power, logic	$5,700 to $150,000
Infotron Systems Corp. **Cherry Hill, N.J.** **(609) 424-9400**	INX-4400, NX-4600	4,000/1M	RS-232/V.24, V.35, RS-422/V.11, Military Communications System Technical Standard-188c, two- or four-wire E&M	4,000 (shared with user side - universal ports)	None	No	None	Yes; 8 maximum	None	Power, logic	$12,000 to $250,000
Microscience Corp. **Atlanta** **(404) 998-6551**	Q-Net Resource Manager	128/19.2K	RS-232	128 (shared with user side - universal ports)	RTS/CTS, Xon/Xoff	No	None	Yes; 2	None, asynchronous only	None	$7,995 to $13,795
Newbridge Networks, Inc. **Herndon, Va.** **(703) 834-3600**	1080, 1082 Mainstreet & 1032 Mainstreet Controller	48/38.4K	RS-232 serial, Centronics parallel	48 (shared with user side - universal ports)	DTR/DSR, Xon/Xoff	No	None	Yes	Serial to parallel, baud rate, flow control conversions	None	$800 to $5,125
Penril DataComm **Gaithersburg, Md.** **(301) 921-8600**	VCX-100, 150 & 1000	304/19.2K	RS-232/V.24, RS-422	38	Xon/Xoff, RTS/CTS, DC1/DC2, ENQ/ACK, Hex 91/93	Yes	None	Yes; 2	None	Power, logic	$1,495 to $41,600
Protec Microsystems, Inc. **Dorval, Que.** **(514) 631-2811**	Byteway 1000, 1000 Plus, Bytelink	11/38.4K	RS-232-C, Centronics parallel	11	Xon/Xoff, DTR/CTS	No	None	No	Parallel to serial, serial to parallel	None	$545 (256K buffer) to $2,055 (2M buffer)
Quasitronics, Inc. **Washington, Pa.** **(412) 228-7373**	Q-8000 Series & The Pipe	512/38.4K	RS-232 serial, Centronics parallel	512 (shared with user side - universal ports)	DTR/DSR, Xon/Xoff	No	None	No	Nonreturn to zero, nonreturn to zero-1, baud rate, parity, stop bits, flow control	Power, logic	$795; depends on configuration
Rose Electronics **Houston** **(713) 933-7673**	Switch-64 & 256	256/19.2K	RS-232	256 (shared with user side - universal ports)	DTR/DSR, RTS/CTS	Yes	None	Yes; 2	None	Power, logic	$1,995 to $22,500
Sequel Data Communications, Inc. **Raleigh, N.C.** **(919) 790-0300**	SDDC-660 & 6192	1,536/19.2K	RS-232, RS-422, Current Loop	1,536 (shared with user side - universal ports)	RTS/CTS, Xon/Xoff, Tandem Computers, Inc. T-Pause	No	None	Yes; 2	Speed, parity, flow control conversions	Power, logic	$2,590 to $176,760
Telecommunications Data Services **Irvine, Calif.** **(714) 474-7744**	Datos Lan	256/64K	RS-232	256 (shared with user side - universal ports)	DTR/DSR, RTS/CTS, Xon/Xoff	Yes	NetWare, Lanlink	Yes	X.25	Power, logic	$2,800 to $89,600
Western Telematic, Inc. **Irvine, Calif.** **(714) 586-9950**	SS-8, 8B, 16 & INCS-64	64/38.4K	RS-232 , RJ-11	64 (shared with user side - universal ports)	DTR/DSR, RTS/CTS, Xon/Xoff, ENQ/ACK	No	None	No	Baud rate, flow control conversions	Power, logic (cold)	$695 to $7,190

DTR/DSR = Data terminal ready/data set ready
ENQ/ACK = Enquiry/acknowledgment
RTS/CTS = Request to send/clear to send
Xon/Xoff = Transmitter on/transmitter off

This chart includes a representative selection of vendors in the data switch market. Most vendors offer other data switches, and many vendors not included offer a full range of competitive products.

SOURCE: PEROT SYSTEMS, DALLAS

(continued from page 43)

Often, only one computer is involved, although some data switches can connect with more than one processor. Without this service, each terminal would require its own full-time port on the processor. The cost of dedicated ports for each terminal, both in the communications environment and in processor equipment, is large and unnecessary.

Terminals are connected directly to the data switch in a star network of cable, dedicated phone circuits or dial-up connections. The data switch is then connected to the assigned number of host ports on each host through direct cabling, individual circuits or a multiplexer facility.

Data switches serve asynchronous terminals in an ASCII environment. When connection to an IBM 3270 host is required, the data switch performs protocol conversion to make the connection possible, usually by emulating a 3274 controller with 32XX terminals.

With many smaller applications capable of moving from the host environment to the end users' personal computers — which act as terminals but run some application code — the host environment is becoming home for very large central applications, and a super file server for large data bases.

Data switch architecture

Data switches have common logic, which, together with the processor and memory, serves the whole unit. They also have power supplies and a physical card cage to house user and processor side ports. The data switch operates in a manner similar to a time-division multiplexer or matrix switch. As user ports become active and request connection to host ports, the connection is passed through the switch and the information is mapped through a time slot on the central bus system.

Since the number of time slots in the system is limited, each port is allocated only the number of slots required to sample signals adequately at its defined data speed. Adequate sampling of high-speed ports requires allocation of more time slots than slow ports. Since the limiting factor in the maximum number of operable channels is often the time slot capacity, the number of terminals served and their data speeds are significant factors in system design.

Many data switches support distributed installations — modules with groups of user ports installed separately from the central unit and connected over cable or data circuits. Some equipment also supports connection through multiplexers that connect to clusters of distant terminals and furnish an aggregate multiplexed data stream to the data switch, called single-ended statistical multiplexers.

The data switch itself does the multiplexing internally. This feature not only allows transmission-effective connection of distant terminals with the same connectivity rights as local terminals, but also allows connection of larger numbers of terminals in most systems.

Equipment redundancy

Three areas of equipment in the data switch are critical to its operation and are commonly available in redundant configuration. The common logic, which usually includes the processors and memory necessary to operate the time slot common bus system — the time-division heart of the equipment — is critical to the operation of the whole system and should be redundant if the system is critical to the operation of the company.

> When there are too many users, data switches usually queue the excess users until ports become available.
>
> ▲▲▲

The power supplies that power the data switches' common logic and port cards are also single points of failure and should be redundant if the system is company-critical. Some vendors even offer redundant backplane bus systems. Since backplane buses, which are collections of wiring and connectors, are also occasionally subject to faults, redundancy is an added protection.

In the active portions of the equipment, redundancy can be handled in two ways. Older designs have two processors, only one of which is on-line at a time. The second processor is a cold standby, which must be activated and loaded with current configuration information from software before it is placed into service. Users are without service during that time. Since a cold standby is untested, there is no assurance that the standby equipment will function correctly when called upon.

The more current approach is to have both processors active all the time, with the standby processor shadowing the activity of the primary unit. Both must be tested constantly to determine their health. In this scenario, the failure of the primary processor initiates a transfer to the secondary unit, which immediately picks up the function, causing minimal impact on user service.

Since data switches are used to connect a large number of user terminals to a smaller number of host ports, it follows that there will be times when there are not enough host ports for the users demanding service. When there are too many users, data switches usually queue the excess users until ports become available to handle them.

Some vendors provide for prioritization of users by user-assigned classes of service that determine the host assets with which the user is authorized to connect. The functionality of the classes or users group limitations varies among vendors, but all offer prioritization in one form or another.

> The common logic is critical to the whole system.
>
> ▲▲▲

Data switches must have communications capabilities to reach distant host processors. The better machines, however, can also network with other nodes of similar equipment in complex networks. Some machines can route user terminal sessions to desired host ports through other switches with available connections when all connections to the desired host from the switch native to the user terminal are busy.

(continued on page 46)

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(continued from page 45)

In addition, in network transmission failure situations, some vendors offer the capability to use alternate routes, similar to the way in which switching statistical multiplexers route user sessions around direct network links that have been interdicted by line failures.

Several vendors have also given users the ability to establish more than one session to different hosts at the same time and to switch among hosts at will by entering a simple but unique key sequence. This feature, called hot-keying, provides users with a windows-like environment from a much less sophisticated software base.

Data switch vendors are involved in a market struggle with vendors of newer systems that offer users features similar to those of data switches, as well as additional features the data switch can't match. Data switch vendors are in a difficult marketing position, which does not bode well for the long-range health of the data switch market.

However, the data switch does have one significant advantage over the new competition: a lower price. A data switch can be installed for less than $2,000 per user and can use existing cabling if terminals are already in place in the building.

A local network installation, however, requires significant changes in the building wiring — if not a total rewiring of the terminal system — and the cost per terminal for local net equipment, file servers, gateways, routers and so forth is usually significantly higher. While new developments allow the data switch to offer some local net-like features, its future will be constrained and its production will continue to be under severe cost pressure to maintain its advantage in local network system comparisons.

Hot-keying provides a windows-like environment.

▲▲▲

Some vendors have developed interface cards to allow user side ports of their data switches to connect directly to an Ethernet local net. That allows ASCII terminals attached to the switch to access Ethernet-attached processors to which they cannot otherwise connect.

Further use as a connection medium for large pools of older ASCII terminals requiring access to various local net configurations — not only in Ethernet but in token-ring and Transmission Control Protocol/Internet Protocol systems — will provide opportunities for installations in mixed environments comprising local net personal computers, traditional minicomputer processors and ASCII terminals.

In these situations, the data switch allows managers to extend local net-based services to all users without incurring the cost of replacing the ASCII terminals with personal computers or interfering with the existing environment operating the ASCII terminals.

Switch vendors are also developing shared printer connections and print queuing of documents to allow their switches to emulate local net file servers in sharing high-quality printers among users. This critical function will prove mandatory in allowing data switches to compete as local net emulators in the mixed distribution environment they best serve.

Data switches face severe competition from local networks and the move to intelligent terminals. That pressure will not only continue, but will increase. Switch vendors will continue to develop features that allow their products to emulate local net operation for ASCII terminals by interconnecting more with local nets and by providing local net-like services such as print spooling for the ASCII terminals.

The data switch will continue to fill a niche in the terminal support environment as a low-cost distribution system for ASCII terminals requiring contention, and for mixed local network and ASCII host environments where ASCII terminals must have access to local network-based host resources. ▣

Letters

continued from page 35

house with a small staff and an office of Intel Corp. 80286- and 80386-based microcomputers, using standard and proprietary tools, can handle development projects that, 10 years ago, required a minicomputer or mainframe, a large technical staff and fairly extensive development time.

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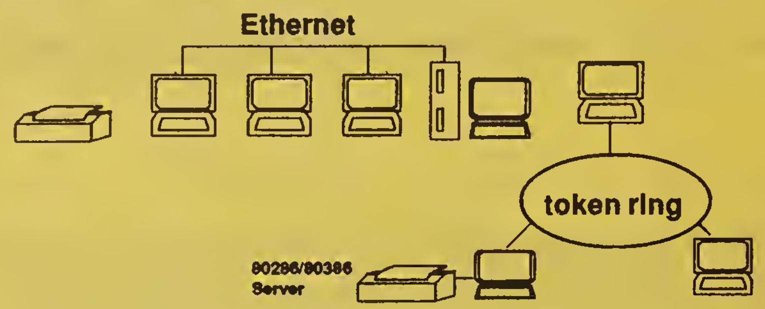

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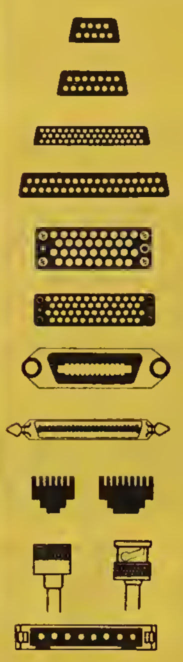

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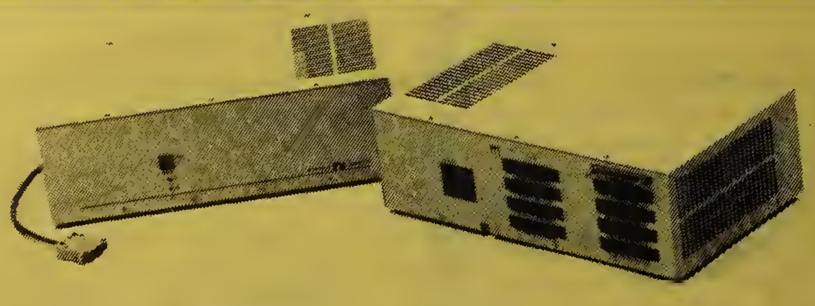

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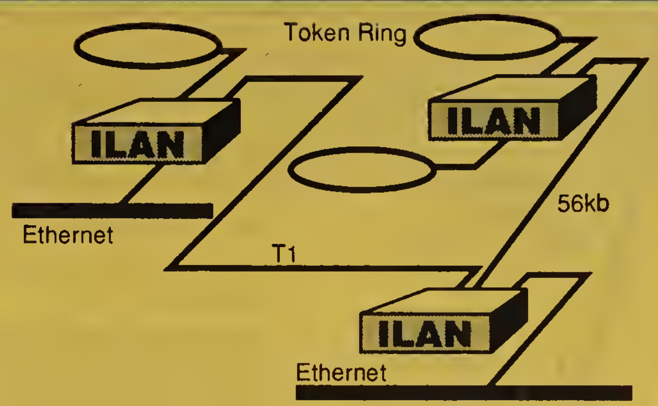

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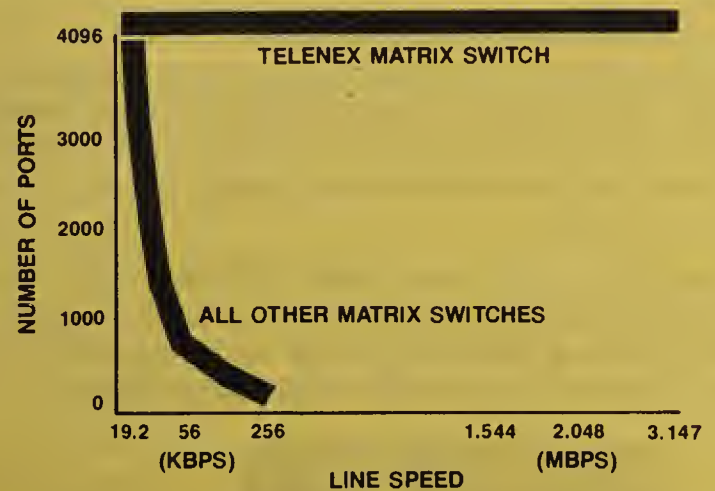

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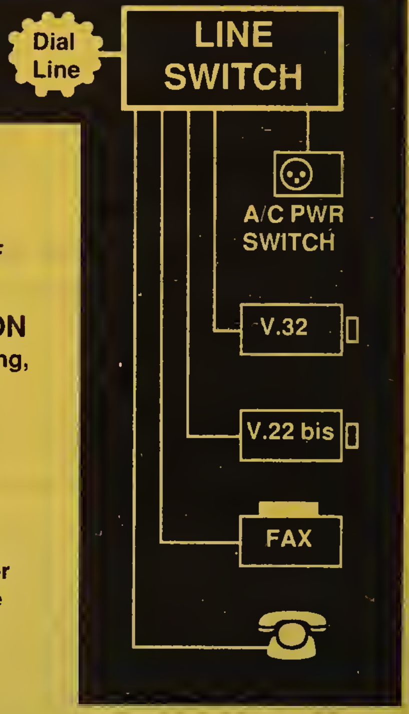

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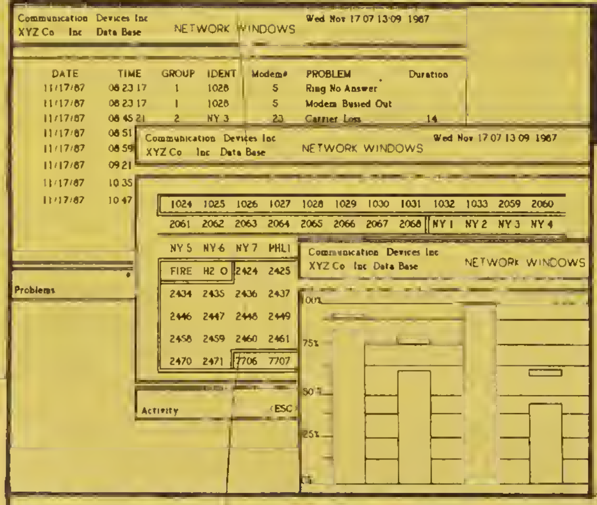

```
Communication Devices Inc                         Wed Nov 17 07 13:09 1987
XYZ Co   Inc   Data Base      NETWORK WINDOWS

  DATE       TIME    GROUP  IDENT   Modem#  PROBLEM           Duration
11/17/87   08 23 17    1    1028      5     Ring No Answer
11/17/87   08 23 17    1    1028      5     Modem Busied Out
11/17/87   08 45 21    2    NY 3     23     Carrier Loss         14
11/17/87   08 51
11/17/87   08 59
11/17/87   09 21
11/17/87   10 35
11/17/87   10 47

Communication Devices Inc                         Wed Nov 17 07 13 09 1987
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1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 2059 2060
2061 2062 2063 2064 2065 2066 2067 2068 NY 1 NY 2 NY 3 NY 4
NY 5 NY 6 NY 7 PHL1
FIRE H2 O 2424 2425
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2446 2447 2448 2449
2458 2459 2460 2461
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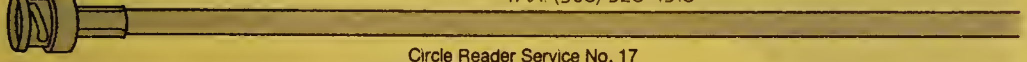

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```
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          calling = 2059109600
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F1-Help HEX          ..  Rx end good frame
RTS CTS DTR DSR CD RI          13:03:32.10
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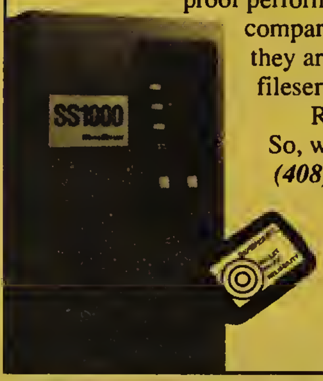

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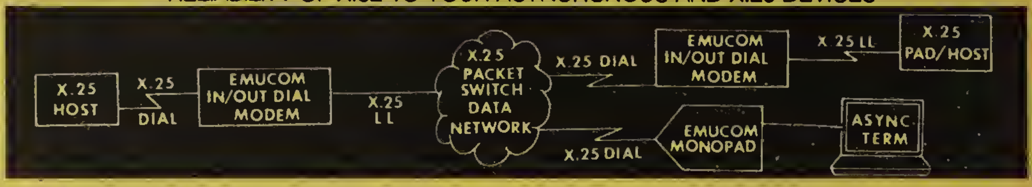

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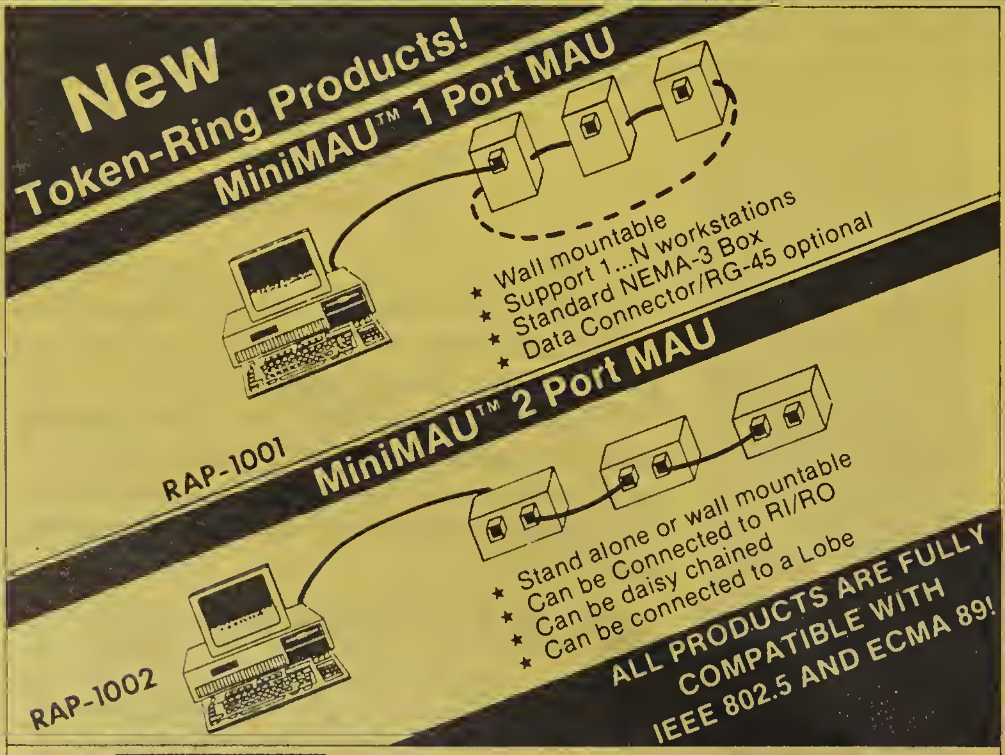
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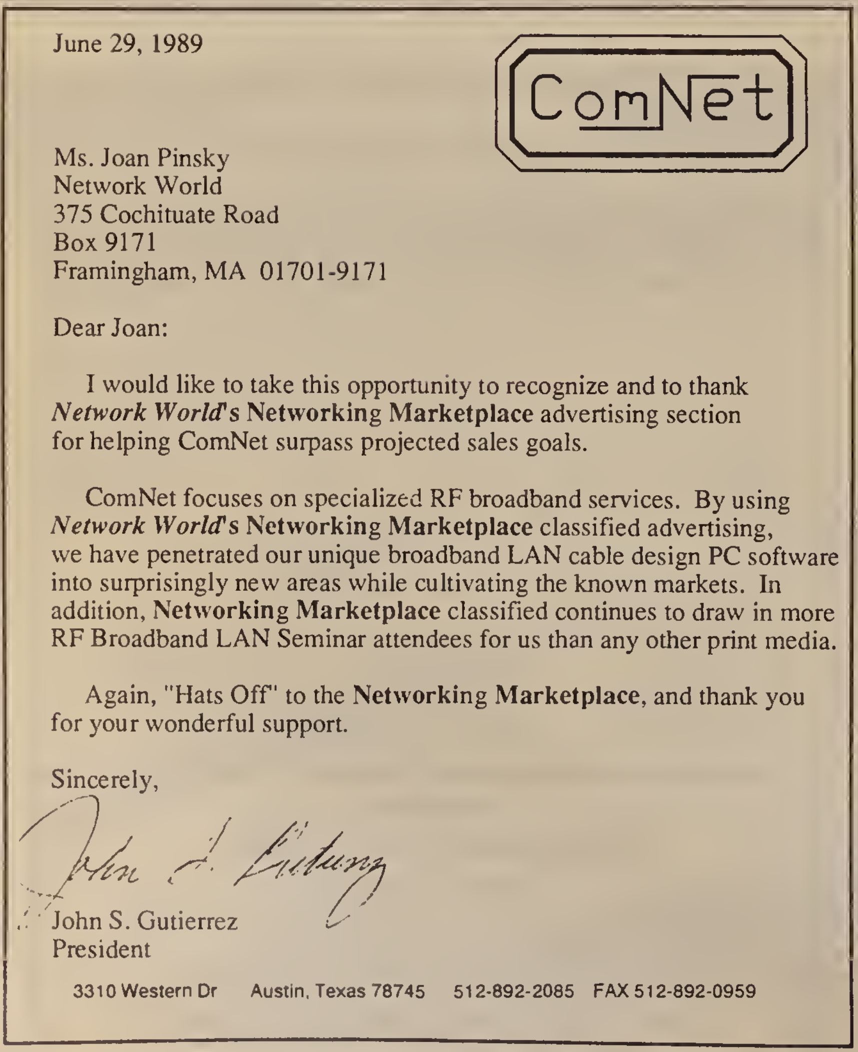

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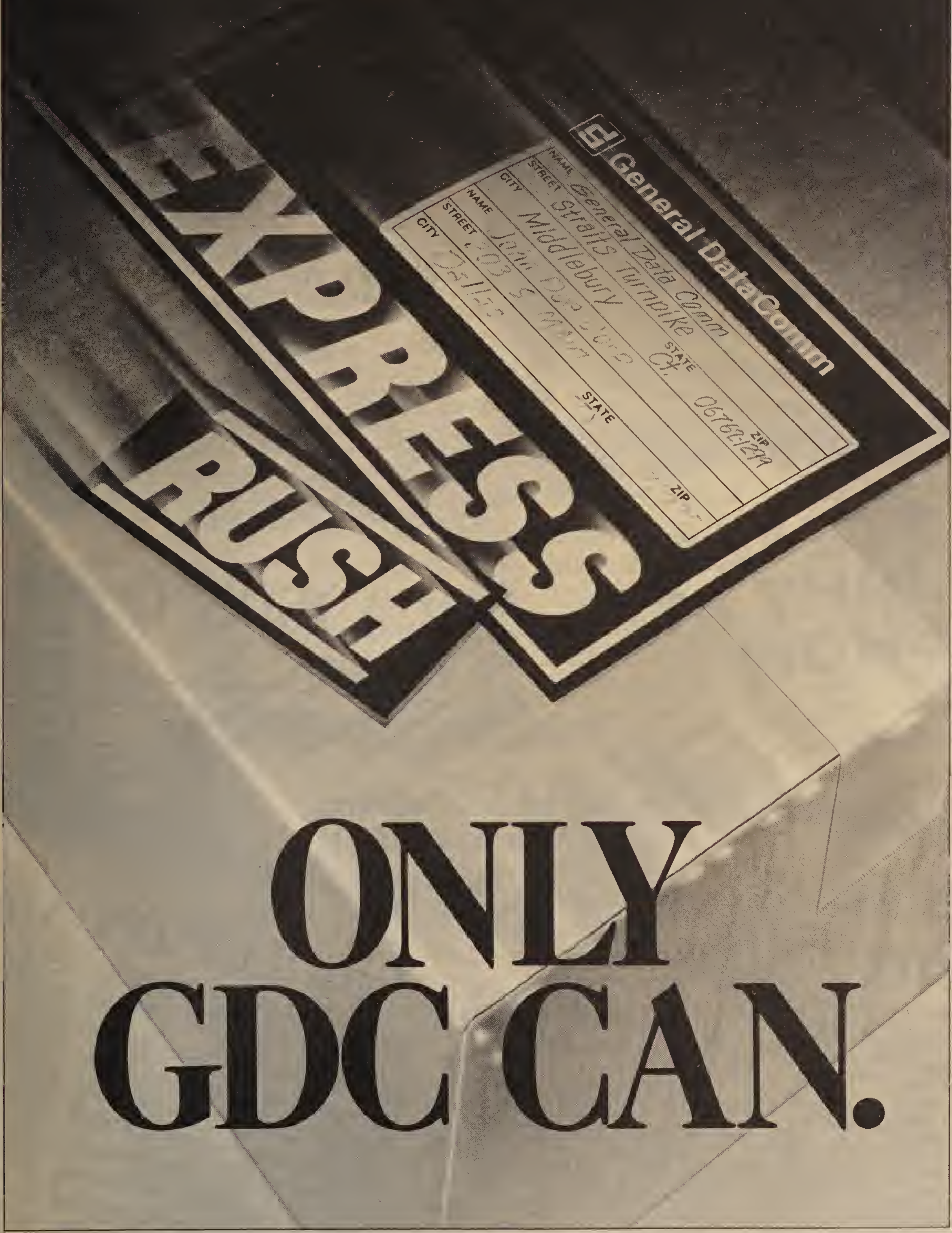

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The ISDN

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Showcasing ISDN applications

BY JEAN S. BOZMAN
CW STAFF

SCOTTSDALE, Ariz. — AT&T last week drew major computer vendors into its quest for MIS and tele support for ISDN techn

After years of prepar able to showcase Inte Digital Network (ISDN) a quipment from such main ors as Tandem Computers, quipment Corp. and Wang La c.

AT&T executives demonstr

that gathers calls from multiple user locations — even those in an IBM Systems Network Architectu can exchange "You ses- ice- ent. nd r

ISDN applications come alive at ICA

Dawn Bushaus, Assistant Editor

Vendors at the International Communications Association convention last week telecommunications history when demonstrated a live using

ISDN STEALS SPOTLIGHT AT ICA SHOW

Twenty thousand people and more than 300 exhibitors are expected at the Dallas extravaganza April 30-May 5

ORE than 300 exhibitors and an anticipated 20,000 people will flock to the Dallas Center the week of April 42nd Annual ICA Conference position.

ng this year's b l show is

An ISDN Opportu

EDITORIAL

When telephone companies and end users gathered in Scottsdale earlier this month to get a firsthand look at what AT&T industry specific ISDN applications, they

demonstrations of

technology Bu
Oddly enough,
the consultant

What AT&T
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AT&T, others offer w of ISDN products at d

By John Cox
Senior Editor

SCOTTSDALE, Ariz. — AT&T last week demonstrated a battery of new and existing Integrated Services Digital Network products at NetPower '89, an exhibition designed nesses

features such as Incom Line Identification. $995, the product will able in April.

NetLine, Inc

ICA ISDN Demo: N

EDITORIAL

There was a lot of talk and, actually, a lot of action about integrated services digital networks at the International Communications conference in Dallas last week. ICA ISDN showcase, Bell Telephone Co., out of ISDN technologies. the trouble to saunter West Ballroom equipment and

At times during the
Southwestern Bell tec
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Indeed, a week ago
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that the AT&T 5ESS
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supports ISDN at Mi
Some fine-tuning wa
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More than fine-tu
running for the

AT&T confirms, expands ISDN commitments

AT&T To Let Telcos Offer Users Free ISDN

BY BETH SCHULTZ

SCOTTSDALE, ARIZ. — AT&T Network Systems last week said it will give its telephone company customers the chance to provide their users with free ISDN service on a trial basis.

AT&T introduced its Customer Opportunity Program at last week's NetPower '89 trade show here, which featured AT&T central office equipment and third-party supplied applications for integrated services digital networks (*CommunicationsWeek*, March 13).

AT&T Network Systems' new program is a two-pronged offering that will let the company's Bell operating company and other telco customers introduce end users to ISDN—at AT&T's expense

under which telcos, are developing ISDN

Although AT&T's ment was the centerp NetPower event, it wa highlight.

Robert Cooper, ente rector with Rochester Rochester, N.Y., said NetPower are essential out of the labs and into

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With ious v develop dealing port, off

'A 'try it; you'll like it' approach' may be the

AT&T To Spotlight 11 ISDN Appli

BY BETH SCHULTZ

SCOTTSDALE, ARIZ. — AT&T Network Systems plans to showcase 11 new ISDN applications for telephone companies and business customers at the first NetPower '89 ISDN forum here this week.

Although AT&T in the past has been involved in forums covering integrated services digital networks, NetPower '89—AT&T's own event—is different, an AT&T spokeswoman said. The company will highlight industry-specific solutions it developed in cooperation with local telephone companies and third-party vendors, using off-the-shelf products.

"This is a way to explain to telcos and end users how ISDN centrex can make the PC [local area network] more productive," she said.

Each of the 11 applications will be demonstrated in settings that depict elements typical of that environment, including customer premises equipment. The security application, for instance, will include a security guard location, a security supervisor office and a central se location.

software from AT&T, Compaq Hilgrave Inc. and

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research and development and The vendors used AT&T's

AT&T spokeswoman
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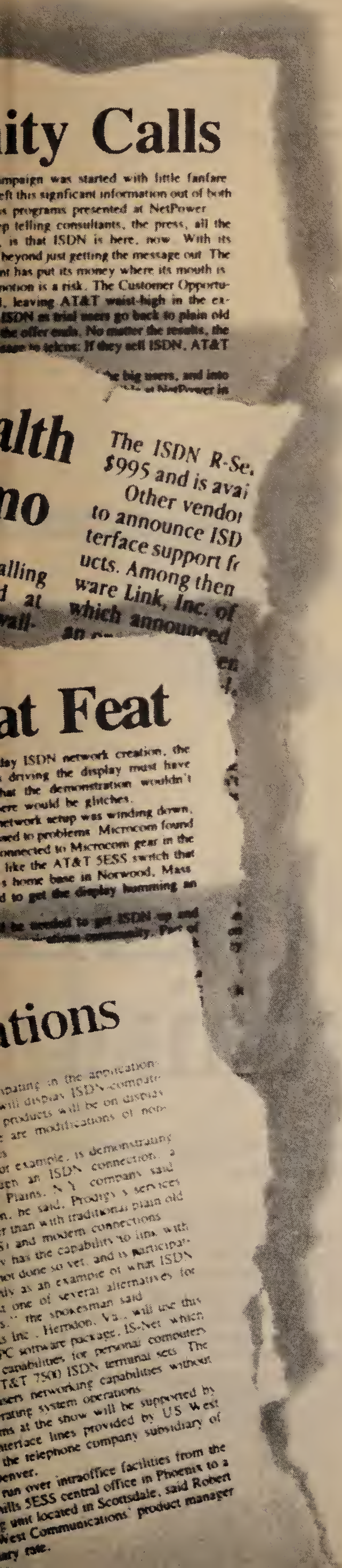

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West Communications' product manager
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Who's really putting ISDN on the map? If you've seen the headlines, you know the score.

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AT&T
The right choice.

MCI unveils billing plan

continued from page 7

Pricing for the digital private-line service includes a fixed monthly fee and a per-mile circuit charge. Circuits of between one and 50 miles have a fixed charge of $63 a month plus $2.50 a mile; circuits up to 100 miles are priced with a $130 monthly fee and a charge of $1.16 per mile. Circuits over 101 miles have a $218 monthly charge plus a fee of 28 cents a mile.

MCI Portfolio will be most attractive to companies with more than five locations, MCI officials said. Kevin Sharer, executive vice-president of MCI, said customers of that size currently have to wade through boxes of billing records each month.

"Telecom managers have told us they have more important things to do than compile numbers; we agree," he said.

Reports are delivered to customers 30 days after the close of MCI's billing cycle. Initially, reports will either be delivered on paper or magnetic tape.

Sharer said the carrier is considering delivering the billing information electronically but declined to specify when such an option might be available.

If MCI Portfolio is put on-line, it will be integrated with MCI's Integrated Network Management Service (INMS), said Kim Lohr, product manager of MCI Portfolio. INMS lets customers access MCI's network via a personal computer to monitor net status and to reconfigure services.

Initially, MCI will offer MCI Portfolio for customers of its Dial 1; Prime Calling Option; Prism I, II, III and Prism Plus; 800 service; MCI Card; private-line service; and WATS.

The next MCI service scheduled for support under MCI Portfolio is Vnet, the company's virtual network service.

MCI chose not to offer MCI Portfolio initially for Vnet customers because Vnet has a relatively small number of users compared to other services, Sharer said. Also, Vnet has a full set of reporting capabilities.

MCI will beta-test the service with about 10 customers by year end and will roll MCI Portfolio commercially in the first quarter of next year.

Pricing for the MCI Portfolio service will vary depending on the number of reporting categories desired by the customer, but it will have a onetime fee ranging between $500 and $2,500, plus a monthly fee that has not been determined.

Telenet switch supports protocols

continued from page 8

lenet, said the TP8000 will be particularly attractive to users with widely dispersed operations such as banks and insurance companies. These corporations often have smaller branch locations that support multiple data applications, each using a different protocol.

Two of the beta-test sites for the TP8000 are banks — one in the U.K. and one in Finland, Holmblad said. Together, they have already ordered 2,000 units. The switch will not be commercially available until the second quarter of next year.

Holmblad declined to give pricing information about the TP8000, saying it will be sold only as part of a network products and services package. "Telenet never has been and doesn't intend to be in the box business," he said.

Telenet will market two primary types of packages based on the TP8000. The first will be an entry-level network package for first-time customers of Telenet's packet network services.

The second package will enable users within a region or a campus environment to set up a subnetwork that allows them to share information locally without accessing the company's corporate backbone. Connections between the packet switches at each customer site would be established over local telephone lines or long-distance lines provided by Telenet's parent company, US Sprint.

U.K. firm signs VPN deal with US Sprint

continued from page 5

Finally, US Sprint said it has agreed to do business with International Digital Communications of Tokyo, beginning Oct. 1. International Digital was formed in November 1986 as a result of liberalized policies adopted by the Japan Ministry of Posts and Telecommunications.

Before that change, Japan's dominant carrier, Kokusai Denshin Denwa, Ltd. (KDD), had been the only carrier licensed to work with international carriers. US Sprint has worked with KDD since August 1986.

"Deregulation of the Japanese telecommunications industry is expected to accelerate growth in telephone traffic between Japan and the U.S.," said Bill Burgess, vice-president and general manager of US Sprint International Services. The carrier already has a 14% share of the traffic to Japan.

Apple's portable spurs rush of options

continued from page 21

bit/sec modem, comes with two copies of Timbuktu 3.0, which allows Portable Macintoshes to log on remotely to AppleTalk networks for screen sharing and file transfers. Two RJ-11 modular extension cables in the pack enable users to plug the portable's modem into a phone jack.

Besides an assortment of small hand tools, the package contains two PhoneNet StarConnectors to link portables directly to other Macintoshes and a PhoneNet-to-LocalTalk Adapter Cable.

The Farallon Portable Pack, priced at $495, is shipping in limited quantities now. Volume shipment is scheduled to begin this month.

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Software lets NetView manage FEP

continued from page 6

formation on the utilization of lines and the amount of access allowed to certain applications.

CSF also enables NetView users to control three NCR Comten front-end processor software options, including: the Multi-Vendor Networking Facility, which allows users to access multiple hosts; NCR Comten's X.25 Interface for packet nets; and the company's Communications Networking System (CNS), which bundles various data traffic onto a single telephone line.

CSF reports network control and management information from these programs to NetView, including traditional SNA information such as virtual route identification, circuit grouping among processors, net congestion and the number of data characters sent and received.

For the CNS trunking software, for example, CSF will tell NetView the amount of data being sent over primary and secondary trunks, as well as the type of data being transmitted. This information can be used for network accounting and tuning to maximize efficiency.

"This product is a direct response to our users' requests to incorporate the [NCR] Comten control ability into the NetView console," Karres said. Advantages to this approach are more simple network management and cost savings.

Users can also continue to manage their NCR Comten networks at remote locations using the NCR Comten console, which can be either an ASCII terminal or a personal computer.

The license fee for CSF, which is scheduled to be available later this quarter, is $400 per month.

NCR Comten said Version 5 of its ACF/NCP offers a greater degree of statistics reporting than IBM's Version 5 Release 1, as well as better performance than its own Version 4 Release 2.

The product, for example, collects statistics regarding virtual SNA routes, transmission groups among processors and the channel connections between a mainframe and a front-end processor. These statistics, which are then passed to NetView, include data counts, packet sizes and number of retransmissions.

Such information is not available in IBM's Version 5 Release 1, Karres said, and it can help users fine-tune their network's performance. Transmission of overly small data packets, for example, could indicate an inefficient virtual route or transmission group. A net administrator could increase the size to fine-tune the link and maximize utilization.

The company said its ACF/NCP offers better performance than its own ACF/NCP Version 4 Release 2 because of the way it manages channels, transmission groups and a variety of protocols and configurations.

Coming down the pike

A future release of the software, Version 5 Release 2, due out in the second quarter of 1990, will feature added support for IBM's LU 6.2 protocol for peer-to-peer sessions among Node Type 2.1 devices over wide-area SNA networks. This will enable terminals and personal computers to communicate as peers.

ACF/NCP provides peer-to-peer connectivity when one of the peers is a Node Type 2.1 host application. By contrast, the new release will allow peer-to-peer communications between two terminals or two personal computers through the NCR Comten front-end processor.

License fees for Version 5 vary, depending on the processor. For an NCR Comten 5620, the monthly fee is $395 and the annual fee is $4,345; for an NCR Comten 5675, the monthly fee is $1,575 and the annual fee is $17,325. ◪

AT&T adds to PBX net mgmt. line

continued from page 7

more efficient with use. Customers can invoke Trouble Shooter from the Trouble Tracker, which requires the Accumaster Integrator interface. They can also use the expert management system as a stand-alone system.

The Trouble Shooter can be used to perform a variety of routine diagnostic tests on PBX components before a trouble ticket is actually created and can isolate a system failure to a device as small as a card.

The software is expected to be generally available in December and can be leased for $2,000 a month.

AT&T Facilities Tracker is an early-warning network transmission testing system that checks analog and digital trunks, modem pooling facilities and Integrated Services Digital Network trunks terminated by AT&T switches.

Facilities Tracker instructs AT&T PBXs to send a tone over a transmission line to a second PBX, which measures signal loss in decibels. If the loss exceeds a preset level, the test data can be passed to the Trouble Tracker for inclusion in a trouble ticket or it can be displayed on a graphics terminal. If the line becomes unusable, the system can instruct PBXs at each end of the link to take the line out of service.

Hanley said Facilities Tracker works with the System 85 and Definity Generic 2 PBXs, and with Dimension switches equipped with Feature Package 8 software.

The package, which shares the Trouble Tracker's processor, can also be purchased and used stand-alone on a personal computer. Facilities Tracker will be available in December for $5,000.

The final product, the AT&T Accumaster Integrator Interface, links Trouble Tracker directly to Accumaster Integrator. The interface is scheduled to be generally available in December for $5,000. ◪

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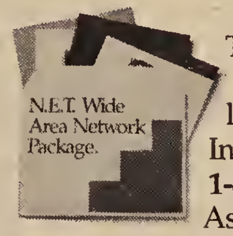

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LAN Manager OEMs await rally

continued from page 1

functionality,'' and no one has done that yet, said Ron Nakashima, director of product marketing for Televideo Systems, Inc., which announced in April 1988 that it would license and sell LAN Manager.

The company has not shipped any LAN Manager products or even announced potential shipment dates. "There haven't been too many people knocking down our doors for LAN Manager,'' Nakashima said. "Until 3Com can demonstrate success with LAN Manager, there will always be the question of whether it is ready to challenge Novell.''

Representatives of Cogent Data Technology, Inc., a manufacturer of high-performance network interfaces and disk controllers that has released a version of LAN Manager, had even sharper words.

"We're finding a tremendous negative reaction to LAN Manager because 3Com's initial release of 3+Open [based on Microsoft's original OEM offering] was so bad,'' said Charles Anderson, Cogent's president. "The current version is much better, but the damage has been done. People are still equating LAN Manager with that first release of 3+Open and saying it's no good.

The original Microsoft LAN Manager release used the old DOS file system, which was inadequate in a file server environment. Each server could support only 255 files open concurrently, and there was no fault tolerance — not even the ability to perform hot fixes.

Ken Davis, vice-president of marketing for Digital Communications Associates, Inc.'s 10NET Communications subsidiary, echoed Anderson's sentiments about the initial release of LAN Manager. DCA had originally scheduled its first LAN Manager products for release in the first quarter of this year but later decided to pass up the first-generation LAN Manager completely.

"We felt it was a very weak product offering,'' Davis said. "We're developing our product on LAN Manager 2.'' DCA is helping Microsoft develop the Comm Server, a communications gateway for the LAN Manager environment.

Some of the OEMs are philosophical about the current state of LAN Manager affairs. "We didn't expect immediate revenues when we decided to license LAN Manager,'' said Janel Killheffer, a product manager for Corvus Systems, Inc., which released a version of LAN Manager last April. "We viewed it more as an investment in the future.''

However, Killheffer acknowledged that Corvus — which has its hands full trying to emerge from Chapter 11 bankruptcy proceedings — is directing its LAN Manager efforts at the European market, which has been more receptive to the new network operating system and "hasn't really been pushing it domestically.''

Killheffer said Corvus remains convinced of the potential of LAN Manager, particularly in view of the OS/2-based net applications such as SQL Server that are beginning to emerge. "Give them six to nine months to get established,'' and LAN Manager sales should start to accelerate, she said.

This notion that OS/2 applications are the key to LAN Manager's success was a continuing refrain among many OEMs.

"My own view is that the market for LAN Manager is not there yet because OS/2 acceptance is much slower than people had anticipated,'' said Dick Meise, president and chief executive officer of Alloy Computer Products, Inc., which has not released its planned LAN Manager products yet. "We need more OS/2 applications.''

One person who takes exception to that view is Tim Taylor, marketing director for Apricot Computers PLC of Birmingham, England. Apricot, which has been reselling Microsoft's MS-Net network operating system for five years, decided to delay development of LAN Manager products because it saw a lot of its planned value-added features being incorporated into the generic LAN Manager by Microsoft.

> "As a tiny company, we especially see this; we need the help of the big boys.''
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"The fact that OS/2 hasn't taken off as quickly as expected isn't a valid issue,'' Taylor said. "You don't need a lot of OS/2 applications; the workstations can all run DOS. The biggest issue is one of branding. Because LAN Manager isn't sold as a single branded product the way NetWare is, it doesn't get the same amount of marketing pull. Marketing is left up to the OEMs; it is not done by Microsoft,'' he said.

Cogent's Anderson said Microsoft, which skipped the recent NetWorld '89 show in Dallas, needs to provide some serious pull-through marketing via presence at key trade shows and advertising.

"As a tiny company, we especially see this; we need the help of the big boys,'' he said.

Anderson said LAN Manager "doesn't have a prayer'' in the short term; he is convinced, however, that it will succeed over time because Cogent helped Microsoft develop the next version of LAN Manager and is already using it internally.

"I wish we could erase everyone's experience with the original version and only let the world see what is coming out this fall,'' he said. "It's wonderful stuff.''

Cigna to save with net services

continued from page 2

AT&T offices in Phoenix, Los Angeles and Orlando, Fla., by early next year.

An early BMS user, Cigna has an AT&T 3B2 computer running AT&T's Accunet Network Management software located at its Philadelphia data center, which can be used to instruct the central office-based Tellabs equipment to reroute traffic around a failed T-1 line between central offices. This rerouting takes about a minute to complete. By contrast, it took nearly five minutes to reroute traffic using Customer Controlled Reconfiguration, an earlier Accunet T1.5 option.

The 3B2 is linked via a 9.6K bit/sec analog private line to a BMS node controller in an AT&T central office in Camden, N.J. That controller communicates with the Tellabs T-1 multiplexers in each AT&T central office.

Cigna is also a beta test site for BMS Extended, which enables it to control and reconfigure the T-1 equipment at its data centers and the T-1 lines between the data centers and central offices.

AT&T declined to say when BMS Extended will be generally available, but AT&T published specifications earlier this year that will enable other T-1 multiplexer vendors to support BMS and BMS Extended.

Using AT&T equipment and services means Cigna doesn't have to build and staff its own sites, Batchelder said.

"We would rather have multiplexing equipment in an AT&T central office than out in a corn field in Kansas,'' Batchelder said, noting that AT&T offices are staffed 24 hours a day and are outfitted to support data communications equipment.

Since March, Cigna has routed roughly 80% of its 320 Dataphone Digital Service circuits to AT&T central offices; the remaining circuits should be routed into the network by next year. About 125 of those Dataphone Digital Service circuits operate at 56K bit/sec, while the rest are 9.6K bit/sec multidrop circuits.

"I save a heck of a lot of money with this as opposed to running point-to-point circuits throughout the U.S.,'' Batchelder said. Aside from collocating another vendor's T-1 multiplexers in AT&T central offices, "this is the only way I know that you're going to get the type of dollar savings we are getting,'' he added.

Cigna uses multiple T-1s to connect each data center to the nearest central office-based multiplexer. It also uses multiple T-1s between each central office. But Cigna left enough excess capacity on the T-1s so that traffic from a failed T-1 can be routed to spare 64K bit/sec DS0 channels on functioning T-1s.

"My goal was to recover 100% of the network if I lost one T-1 circuit,'' Batchelder said. "If I lose one of my data centers, my Dataphone Digital Service tail circuits remain whole. All I have to do is route via BMS to where my disaster contingency locations are.''

Using the 3B2, Cigna builds alternate routing tables that are loaded into the multiplexers in each AT&T central office as well as in Cigna's data centers. The Tellabs equipment then automatically reroutes traffic when network failures occur.

Cigna does not use a BMS feature that enables users to automatically reconfigure bandwidth according to the time of day to accommodate changing needs.

The 3B2 also collects extended superframe format (ESF) network management data, which is used on T-1 lines. ESF helps users distinguish between transmission and hardware problems.

"I think there is a big misconception about BMS,'' Batchelder said. Some people believe BMS users "turn network ownership and control over to AT&T. That is not the case in our example.''

In fact, Batchelder said AT&T is linked to the 3B2 in Cigna's data center, not vice versa. "The collection point for all network management data is on my premises. So when I get the data, AT&T gets the data.''

Additionally, Cigna can use the 3B2 to troubleshoot Dataphone Digital Service circuits. Batchelder said IBM's NetView host-based network management software will detect when terminal-to-host sessions are dropped, giving network operators a hint that a Dataphone Digital Service circuit may have failed.

Network operators then use the 3B2 to conduct loop-back tests on the Dataphone Digital Service circuit. If the circuit fails, the problem is turned over to AT&T for resolution.

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Unisys to market AT&T's Integrator

continued from page 2

research for Business Research Group, a research and consulting company in Boston. Formed by the merger of Sperry Corp. and Burroughs Corp., Unisys supports both companies' products as well as products from Timeplex, which it acquired in January 1988.

The agreement also benefits AT&T by giving Accumaster Integrator additional market visibility, analysts said. Unisys is expected to increase Accumaster Integrator's appeal by developing additional data network management applications that work with the product. Unisys, which recently signed on for an AT&T Tariff 12 custom network contract, is an early Accumaster Integrator user.

Managing partners

The agreement calls for the Unisys field sales force to familiarize itself with Accumaster Integrator and identify potential users from Unisys' customer base, said Jon Tempas, Unisys' vice-president of networking product marketing for U.S. information systems. Unisys sales representatives would then join AT&T support staff members on a joint sales call.

Unisys and AT&T also said they intend to pursue an international agreement involving Accumaster Integrator.

Frank Ianna, director of business services development and network management for AT&T, said the "relationship is a natural fit" because it builds "on the strengths of both companies."

According to a new report by The Yankee Group, a Boston-based consulting firm, "This agreement will give Unisys customers greater network control in a wide variety of networking applications."

Jack Freeman, senior analyst for data communications at The Yankee Group, added, "It's the first real effort by a third-party vendor to interface with the Integrator."

About 40 vendors have announced they will support interfaces to Accumaster Integrator, according to Unisys.

Unisys' first Accumaster Integrator interface will be for the Time/View Network Management System, which is further along in development than Unisys" other net management products, a company spokesman said. But Unisys' product groups will also begin work on Accumaster Integrator interfaces, Tempas said. Unisys plans to develop Open Systems Interconnection-based Accumaster Integrator interfaces either for existing communications processors or forthcoming network management systems.

A schedule for delivery of these interfaces will be released later this year, a company spokesman said.

Unisys and AT&T are founding members of the OSI/Network Management Forum, which was formed to speed implementation of International Standards Organization net management standards.

Unisys now has "substance" to back up its support for OSI net management, Freeman said. "This thrusts Unisys into the OSI network management market," he said.

Easier to support than build

Unisys said it had several reasons for supporting Accumaster Integrator instead of building its own product for managing network management systems.

For one, AT&T's product is similar to the integrated network management system Unisys had envisioned developing, Tempas said. Building such a network management system would be expensive and time-consuming, Tempas said. Unisys' money and human resources would be better spent adding to Accumaster Integrator's capabilities.

Stratus lays out ISDN interface blueprints

continued from page 6

held in queue until other agents are available to answer them.

Besides end users, Stratus plans to target its products at enhanced service providers and regional Bell holding companies. "The strategy is aimed at giving them the ability to use a Stratus computer in mission-critical ISDN applications," Hart said.

Products offered under Stratus' ISDN marketing program will be available in the early 1990s, the company said.

As part of its ISDN strategy, Stratus announced an agreement with AT&T to develop an XA2000 software interface that complies with AT&T's Adjunct Switch Application Interface (ASAI). AT&T plans to publish ASAI in the fourth quarter.

ASAI complies with the Basic Rate Interface and CCITT Q.931 and Q.932 specifications for signaling protocols. It defines a set of messages — including call connection, call disconnection and call transfer — to be passed between computers and PBXs, according to Dave Bartz, division manager of switching systems planning at AT&T. The interface will be implemented on Stratus systems running Unix System V and is intended to fuel ISDN application development by third parties.

"Our intention is to work with third parties and have them take current applications, move them to ASAI or develop new applications that meet the standard," Hart said.

The ASAI interface should be available in the early 1990s.

Stratus' minicomputers could bring a higher level of reliability to ISDN applications, according to John Powers, director of new business development at Nelson Communications, Inc., a consulting firm in Waltham, Mass.

"What this might do is quiet the critics who are saying there are pieces of the ISDN delivery system that have requirements for uptime that are significantly higher than most hardware AT&T [can] provide," Powers said.

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Sun heralds products for strategy

continued from page 2

products. "The products are pragmatic: They won't break any new ground, but they are necessary components for a network and to demonstrate to users that Sun does indeed have a cohesive strategy," he said.

The new network management product is a program offering called SunNet Manager, which is available for Sun systems based on the Scalable Processor Architecture (SPARC) and its 68000-based Sun-3/60 and Sun-3/80 workstations.

SunNet Manager can be used to administer, troubleshoot and diagnose problems with workstation clusters and, in the future, will be capable of transmitting event information to larger enterprisewide network control systems such as IBM's NetView.

The SunNet Manager currently supports Simple Network Management Protocols in Transmission Control Protocol/Internet Protocol local nets but will eventually support Common Management Information Protocol (CMIP) and CMIP over TCP/IP (known as CMOT) in Open Systems Interconnection environments, according to Larry Garlick, vice-president of Sun's Distributed Systems Division in Mountain View, Calif. Sun plans to announce more details about its network management products at this week's Interop '89 show in San Jose, Calif.

SunNet Manager utilizes AT&T's Open Look graphical user interface employing icons, mouse controls and pull-down menus to control workstations, routers and bridges, Garlick said.

The package features event management and performance monitoring. It notifies net administrators when net devices fail and can sound a warning when a net resource — a disk drive, for instance — reaches 90% capacity, helping to avoid failures. The software also displays data on bandwidth or CPU usage.

SunNet Manager will be available in the first quarter of 1990. It costs $10,000 for a single-user copy that can monitor and control 50 to 100 nodes. In quantities of 10 or more, SunNet Manager is priced at $4,000 per copy.

Another first for Sun is its FDDI/Dual Attach Controller (DX), a VME board that lets users attach Sun workstations to 100M bit/sec FDDI fiber-optic local networks. It is fully compliant with the existing ANSI X3T9.5 FDDI standard.

The FDDI/DX allows Sun workstation users to route data from Ethernet subnetworks across the FDDI backbone. Since every Sun workstation comes equipped with an Ethernet connection, once the FDDI/DX is installed, the Sun workstation becomes a bridge between the Ethernet systems and the FDDI backbone.

The FDDI/DX board costs $12,500, but Garlick said he expects pricing will fall in the next few years to about 15% to 20% of the cost of a workstation.

Sun will also sell its firmware implementation of the still-undefined Station Management software portion of the FDDI standard, which contains the necessary software to locate and isolate network failures. The firmware implementation will cost an additional $150. FDDI/DX will ship in November.

Sun also introduced the High-speed Serial Interface (HSI), a board-level device for Sun workstations and servers that links workstations to other Sun products over 1.544M bit/sec lines.

The two-board sets support up to four T-1 lines for high-speed data communications among local nets, Garlick said. Previously, Sun only supported file transfer speeds of 1M bit/sec.

HSI sells for $6,000 and is available now.

The final product announced under SunNet is the SunLink Channel Gateway, a combination hardware/software product that lets Sun workstations be channel-attached to IBM System/370 mainframes at 3M byte/sec.

The Channel Gateway resides in any Sun server and can support an unlimited number of workstation users.

The interface is targeted at scientific, seismic and computer-aided design and manufacturing workstation users who need to do large file transfers between host mainframes and their Sun workstations, Garlick said.

SunLink Channel Gateway costs $20,000 and will be available in the first quarter of 1990.

Sun also announced SunNet License, which lets a firm buy a number of licenses and share them among corporate users.

A network server administers the license pool, granting applications access to users on an as-needed basis. Whenever all the licenses are in use, it queues up the other requests for the application and grants access when one becomes available.

SunNet License is available in the first quarter of 1990; pricing has not yet been finalized.

> SunNet License lets a firm buy a number of licenses and share them among corporate users.

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Calendar

Oct. 15-17, New York — Preparing for 1992: Marketing Telecommunications Products and Services in Europe. Contact: CAP International, 1 Longwater Circle, Norwell, Mass. 02061; (617) 982-9500.

Oct. 16-17, Detroit — Telecommunications Technologies for the Non-Engineering Professional. Contact: Data Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015; (201) 478-5400.

Oct. 16-18, Seattle — Planning an EDP Disaster Recovery Program. Contact: Computer Security Institute, 360 Church St., Northborough, Mass. 01532; (508) 393-2600.

Oct. 16-20, Houston — Open Systems Interconnection. Contact: Omnicom, Inc., 115 Park St., S.E., Vienna, Va. 22180; (703) 281-1135.

Oct. 17-19, Dallas — BIZCOM '89. Contact: Conference Management Corp., 200 Connecticut Ave., Norwalk, Conn. 06856; (203) 852-0500.

Oct. 17-19, San Jose, Calif. — SCAN-TECH '89. Contact: Automatic Identification Manufacturers, 1326 Freeport Road, Pittsburgh, Pa. 15238; (412) 963-8588.

Oct. 18, New York — Network Synchronization Seminar. Contact: Instrumentation and Measurement Society, c/o Jeannie Franklin, Friedman Associates, Inc., 2424 Morris Ave., Union, N.J. 07083; (201) 964-6200.

Oct. 18-19, McLean, Va. — Telecommunications Managers Association of the Capitol Area '89. Contact: Larry Craven, Atlantic Research Corp., 5390 Cherokee Ave., Alexandria, Va. 22312; (703) 642-4000.

Oct. 18-20, Washington, D.C. — Network Capacity Planning. Contact: Institute for Information Management, Inc., P.O. Box 361556, Milpitas, Calif. 95035; (408) 954-0114.

Oct. 18-20, Newport, R.I. — 12th Annual Newport Conference on Fiber Optics. Contact: NCFM, KMI Corp., America's Cup Ave. at 31 Bridge St., Newport, R.I. 02840; (401) 849-6771.

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Gary J. Beach/**President**
Paul McPherson/**Director of Advertising Sales**
Network World Publishing Headquarters: 375 Cochituate Road, P.O. Box 9172, Framingham, MA 01701-9172, Phone: (508) 820-2543, Telex: 95-1153, FAX: (508) 879-3167

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NetFrame ushers in the superserver era

continued from page 1

mainframe architect Gene Amdahl.

Amdahl began working on NetFrame three years ago when he saw the need for local network users to have servers with greater performance, capacity and reliability, without sacrificing existing software to get it.

Amdahl said NetFrame combines state-of-the-art very large-scale integration technology and off-the-shelf, mass-produced components. The servers have a hierarchical bus architecture that mimics the multiple, independent bus structure of a mainframe.

A main central processor — an Intel 80386 in the NF-100 and NF-300, and an 80486 in the top-of-the-line NF-400 — runs the network operating system. Network and disk I/O are handled by multiple, 80386-based subsystems running a special real-time operating system and an I/O application developed by NetFrame. The I/O server boards are connected to shared memory via parallel buses.

These same buses also support single-board computers that can run server-based applications such as the Microsoft/Ashton-Tate SQL Server, or even an auxiliary network operating system. Amdahl said a NetFrame could be used to run both NetWare and LAN Manager, using each for what it is best at.

NetWare could be running on the main processor, providing traditional file service, and LAN Manager could be run on an application server, running server-based applications. "We want to be the Switzerland of servers," Amdahl said.

Amdahl said the NetFrames are also distinguished from traditional servers by reliability features, such as parity checking on all data paths. The company said between 20% and 25% of NetFrame's circuitry is devoted to error checking, compared with 1% in a personal computer.

Businessland, Inc., which initially will be NetFrame's exclusive distributor, received its first model several weeks ago, and company Chairman David Norman confirmed reliability reports. He said it is the first new product his testing engineers, "after two weeks of pounding," have been unable to break.

Network administrators can manage a NetFrame from a net-attached 80386- or a remote 80286-based workstation equipped with remote-console software running under Microsoft Windows.

NetFrame President Enzo Toresi said the systems are priced about 10% higher than similarly configured traditional file servers, while providing three to eight times the throughput. Base pricing for the NF-100, NF-300 and NF-400, not including the network operating system, is $22,500, $35,000 and $45,000, respectively.

The NF-100 supports up to 2.2G bytes of disk storage, 32M bytes of system memory and three I/O servers.

The 80386-based NF-300 and 80486-based NF-400 support a total capacity of 6G bytes (more with additional enclosures), 64M bytes of system memory and up to eight I/O servers.

Each I/O server incorporates a Small Computer System Interface II controller, a LocalTalk, an Ethernet or a token-ring adapter, and an RS-232 port. The NF-100 and NF-300 should be available next month, while the NF-400 is scheduled for release in January. Application servers will not be available until next year.

The systems currently run a special version of NetWare 386 that includes drivers for the NetFrame subsystem hardware, and a similarly customized version of LAN Manager is being developed for a January release. The network operating system software is purchased separately from NetFrame at list prices. ◘

Conference goers remain hopeful

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nounced two weeks ago, that provides microcomputer users with 64K bit/sec links to microcomputers and mainframes through ISDN-compatible switches ("PC ISDN interface supports 64K links through PBXs," *NW*, Sept. 25).

The actual demonstration linked a personal computer to an IBM 4341 host in Denver through two AT&T ISDN-compatible switches linked via a T-1. AT&T used its proprietary ISDN-like interface, Digital Communications Protocol, which supports two 64K bit/sec B channels and one 8K bit/sec D channel, instead of the Basic Rate Interface. The personal computer in the demonstration was able to view data on the remote host but was unsuccessful in retrieving files. Two AT&T representatives who tried to execute the file transfers said they weren't experienced enough to resolve the problem. ◘

Consumers Software adds X.400 gateway

continued from page 4

ate personal, post office and network addresses. Personal addressing lets users send a message using a simple alias instead of a full address. Information about recipients can be stored in a Personal Address Book maintained by an individual user.

Post office addressing enables a network administrator to establish an alias for multiple recipients within a post office.

Under the network addressing scheme, users can broadcast a message to 100 or more recipients using a single name that is linked to multiple addresses.

The Network Courier 400 is scheduled to ship in December. The host software and X.25 interface card together cost $3,500, while the Inter-network Courier costs $1,000. Every post office that can support 150 users must have The Inter-Network Courier. ◘

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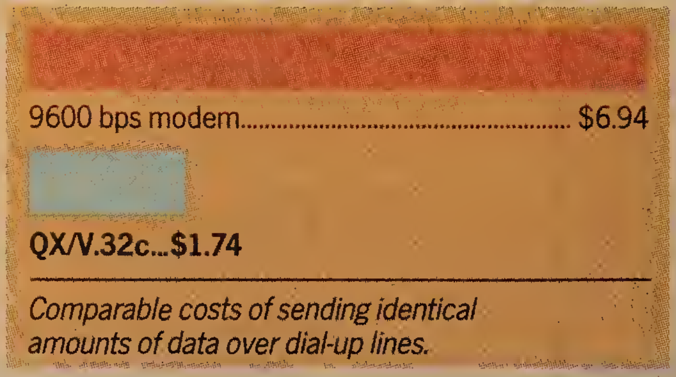

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